

# Plasma One Point Repair 2004

**NOTE:**

Active links in this document  
are outlined in blue.

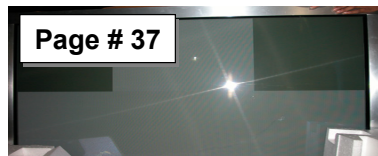
## Contents

- I . Visual repair Index**
- II . Introduction to Plasma**
- III. Service Adjustments**
- IV. Trouble shooting**



## 60" Known Visual problems with boards that fixed

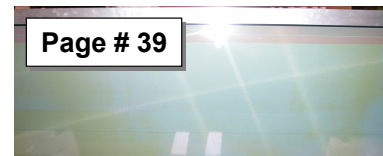
## Visual repair Index



Control Board & Y-Driver Amp



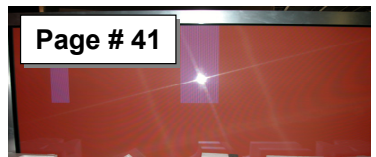
Y- Amp



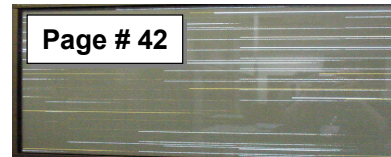
Y-Driver Amp



Y-Driver Top

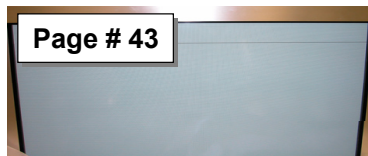


Control Board



X-Board upper right

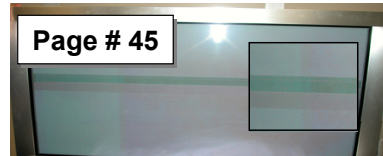
## 60" Known Visual problems with boards that fixed



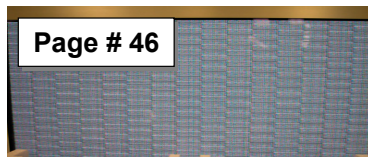
Y-Driver - Top



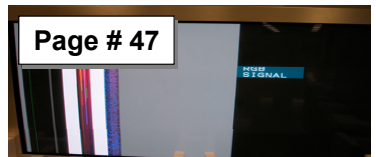
VSC- Board



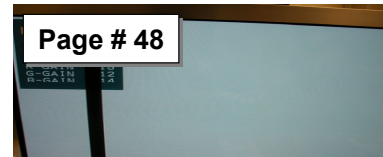
Y-Driver - Top



VSC- Board



X- Board ( Top Right)

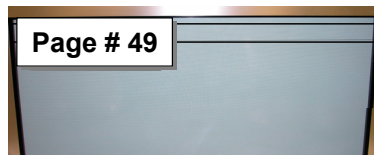


Y-Driver amp and X-Drive Top

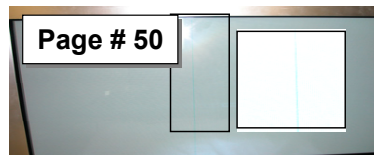


## 50'' Known Visual problems with boards that fixed

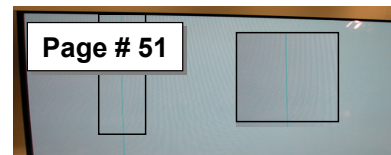
## Visual repair Index



Y-Driver Amp upper



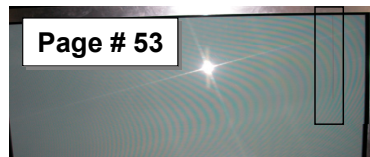
Control board



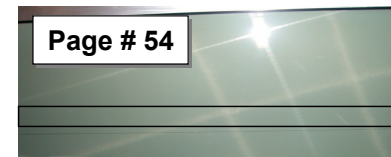
Control Board



VSC Board

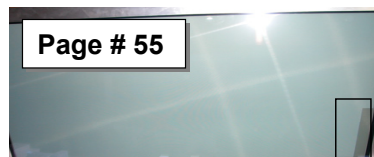


X-Board upper right

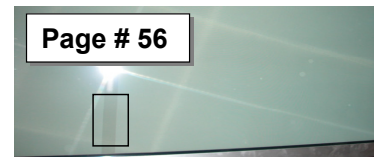


Y- Driver Amp bottom

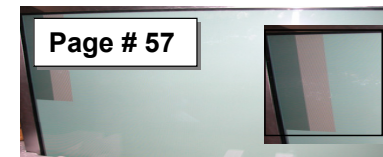
## 50'' Known Visual problems with boards that fixed



X- Board ( Lower Right)



X- Board ( Lower Left)



Control Board



Y- Driver Bottom



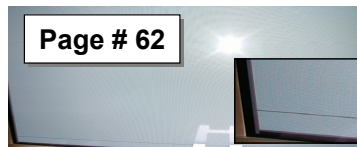
Y- Driver Amp and X-Drive Top



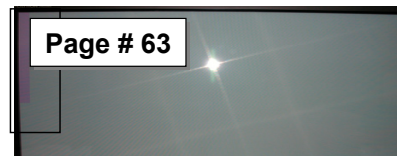
Control Board



Data @ X-Board – Yes/ tested for shorted FOC IC – Ribbon shorted/ Defective Panel



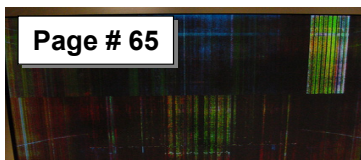
Installed Y- Driver Amp bottom no Change/ Defective Panel



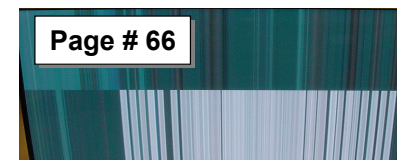
Data @ X-Board – Yes/ tested for shorted FOC IC – Ribbon shorted/ Defective Panel



Display's waves - VSC

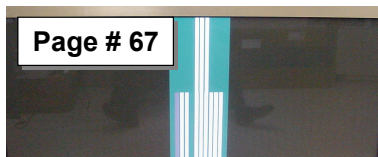


Y-Driver - Top

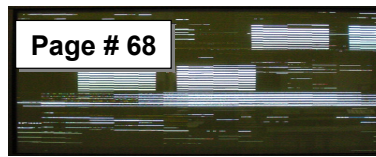


Y-Driver - Top

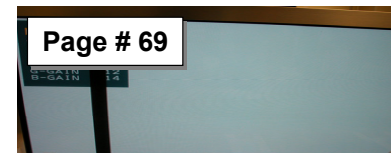
## 42" Known Visual problems with boards that fixed



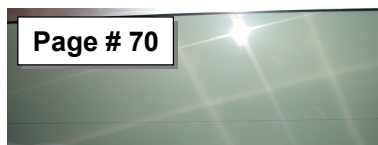
Y-Driver - Top



VSC- Board



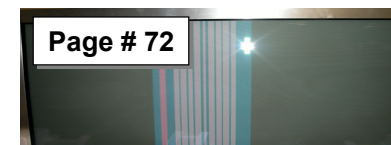
Y-Driver - Top



Y-Driver Amp upper

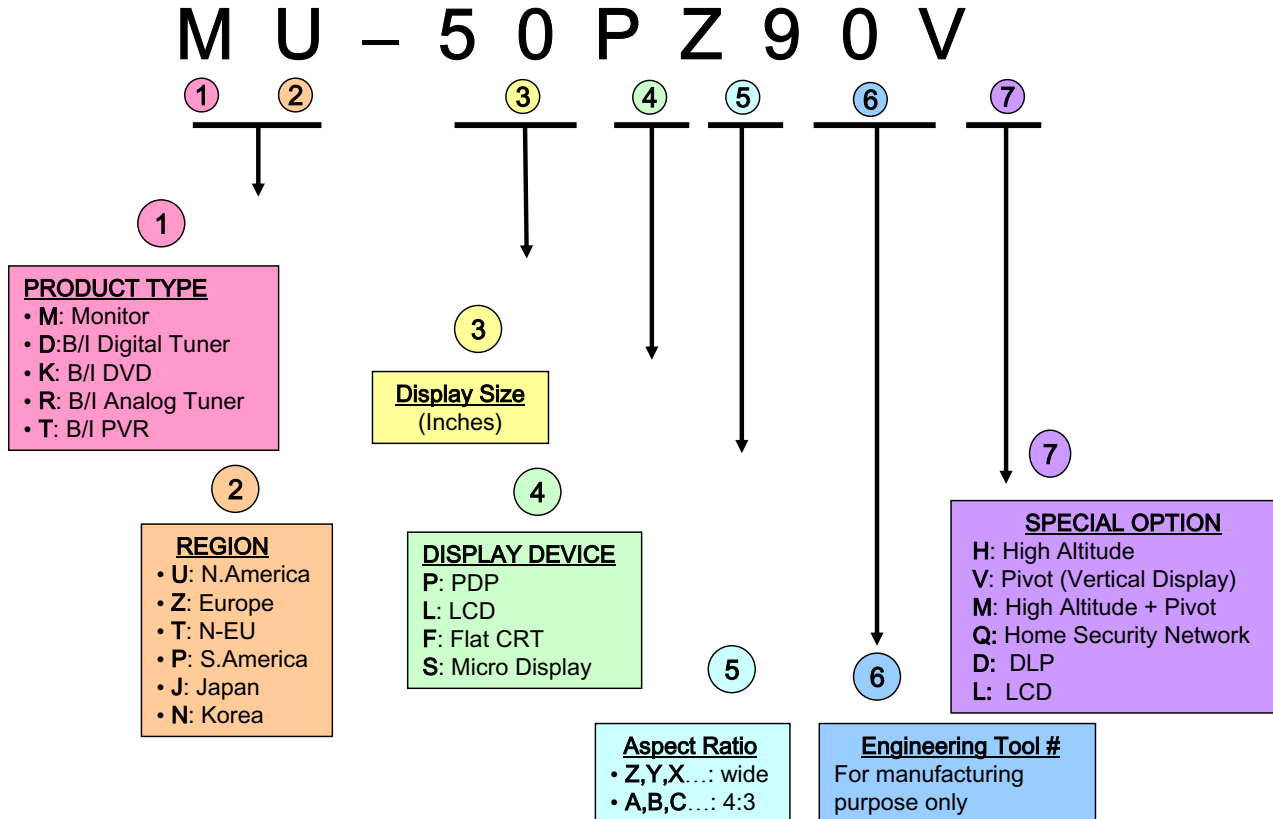


Control board



Control Board

# Understanding Model Numbers for LG Display's



# Introduction to Plasma

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## How the power supply works

**Voltages for VS:** Supplies support to the Y-Amplifier for horizontal grid voltage. If the required voltage is not + or – 3% you may see the following in the picture: lines from side to side or left to right, half picture top or bottom, intermittent shutdown or dead.

**Voltages for VA:** Supplies support to the Z-Amplifier for vertical grid voltage. If the required voltage is not + or – 3% you may see the following in the picture: Comets, washout, bleeding, intermittent shutdown or dead.

To start to understand plasma one must look for why this voltage is not within specifications. In LG – Zenith line of plasmas there are several power supply set-ups as follows: 60" plasma is made-up of a primary and secondary power supply followed by a DC to DC converter. This is to support the massive current that's required to sustain picture quality.

The 50" and 42" plasma power supplies are consolidated into one board. In the 60" anyone of the three parts could be out of adjustment. In the fifty and forty two the voltages need to be still verified in chronological order. In most cases if your facing a dead set scenario this is caused by a shorted Y or X-driver board.

Testing for defective Y-drive boards can be done by looking for a voltage drop if this is located in the Y-sustain disconnect power and remove one Y-driver boards at a time until Y-sustain voltage is accurate. If Y-sustain does not respond with proper voltage supplied replace. Testing for defective X-driver boards can be done by powering down and disconnecting each X-driver and powering on each quadrant at a time.

**Pulse Frequency Coefficient:** (PFC) adjustment is Located the primary supply and is for aligning grid voltage. The panels grid voltage averages 360 to 380 volts depending on panel circuit.

### **Known symptoms:**

No Power

Intermittent Power

Picture dimming to bright during certain scenes

Primary colors off, Hue or flesh tones

Colors bleeding

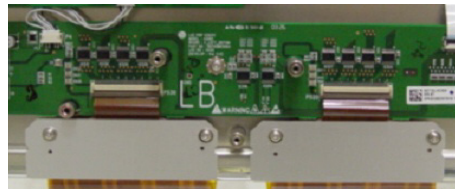
Left to Right picture is dark to bright

# Introduction to Plasma

## 1. X B/D

Receiving LOGIC signal from CONTROL B/D to make ADDRESS PULSE generating address discharge by an ON/OFF operation, and supplies this waveform to COF IC (data) or ribbon IC.

X B/D



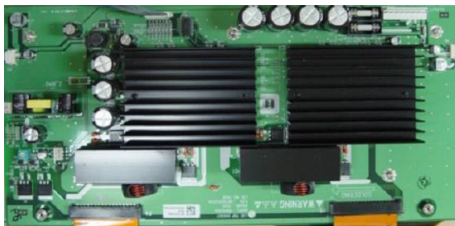
## 2. Z sustain B/D

Responsible for making SUSTAIN PULSE and ERASE PULSE that generates SUSTAIN discharge in panel by receiving LOGIC signals the CONTROL B/D.

The Sustain discharge waveform is supplied to panel through FPC (Z B/D).

Composed of IPM, FET, DIODE, electrolytic capacitor, E/R coil.

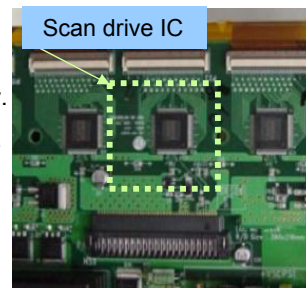
Z B/D



## 3. Y drive B/D

- 1) This is a path to supply SUSTAIN ,RESET waveform which is made from Y SUSTAIN B/D to panel through SCAN DRIVER IC.
  - 2) Supplies the waveform that selects Horizontal pulse (Y SUSTAIN pulse) sequentially.
    - Potential difference is 0V between GND and Vpp of DRIVER IC in SUSTAIN period.
    - Generated potential difference between GND and Vpp only in SCAN period.
- E/R (Energy recovery)
  - COF (Chip On Film)
  - IPM (Intelligent Power Module)

Y SUB-AMP B/D



# Introduction to Plasma

## 4. Y sustain B/D

Generates SUSTAIN, RESET waveform, VSC (SCAN) voltage and supplies it to the Y DRIVER B/D.

Composed of IPM, DIODE, electrolytic capacitor, FET.

## 5. Control (logic) Board

Creates signal processing (Contour noise, reduction ISM,...) and an order of many FET switching IC's on/ off of each DRIVER B/D with R,G,B to each 8bit input COF ribbon IC.

Supply voltages 3.3V/ 5V.

## 6. IPM (Intelligent Power Module)

Connected to Z B/D and Y B/D, making Sustain waveform.

Sustaining and supplying a square wave to panel, creating video.

### Composition

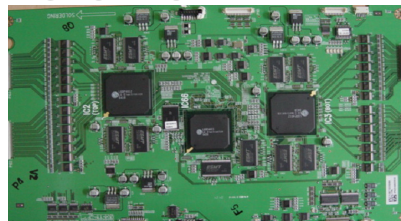
CAPACITORS/ DIODES/ IC LINEAR/ RESISTORS, TRANSISTORS and FETS.

- E/R (Energy recovery)
- IPM (Intelligent Power Module)

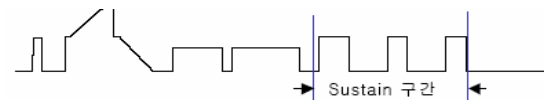
Y-AMP B/D



DIG CONTROL B/D



Z-APM B/D





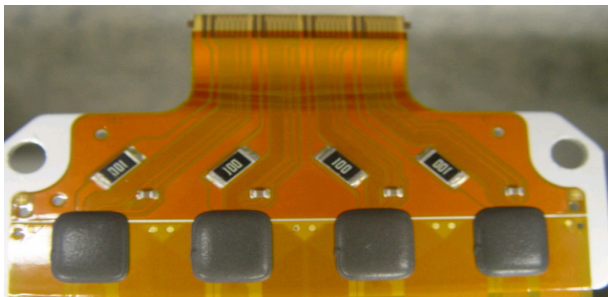
# Introduction to Plasma

## 7. Ctrl B/D

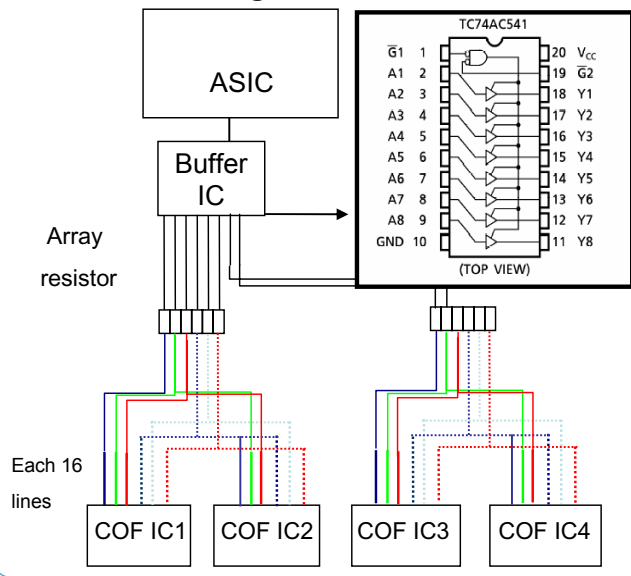
CTRL B/D supplies video signal to COF. So if there is a bar defect on panel this may be the ctrl b/d creating this problem.

### Flow, address signal

In the figure to the right shows data path to COF IC In this description you can see how missing data can affect the panel.



<Diagram of ctrl b/d>

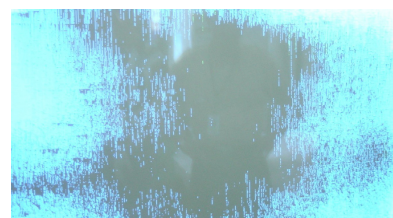


## 8. Checking order

1. Confirm Y, Z SUS signal cable.
2. Check Y DRV IC FAIL
3. Check Y sus b/d voltages ( $-V_y.V_{scw}$ )
4. Check Y,Z-SUS IPM fail
5. Replace CTRL b/d



A. Mal-discharge problem Y-drive, Z -b/d.



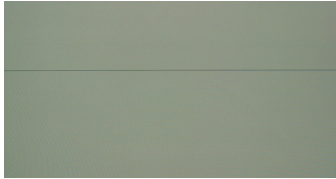
B. Check VA and VS Voltage if occurred.

# Introduction to Plasma

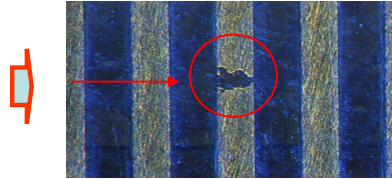
## 9. Check FPC

In case of horizontal 1 or more line, it is due to FPC or panel inside .ctrl b/d, Y b/d is just normal. First , clean the FPC electrode with a cloth to clean off the ribbon connection removing particles.

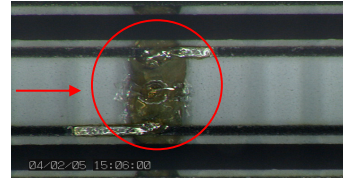
Horizontal line.



COF ribbon to panel open



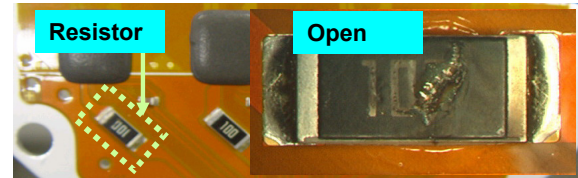
Cell/ break down



## 10. Checking address COF input of resistor and IC

### ▶ COF resistor check

Check the both side of resistor With Digital multi meter(DMM) .  
If the resistor is okay, the resistor value should be  $10\Omega$  if open  
replace resistor.

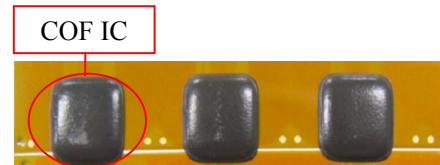


## 11. COF (Chip On Film)

Supplied with the X B/D waveform to the panel, controls grid & zones by switching on or off the 96 pin COF IC.

— the higher the resolution, the less spare space on the IC.

- E/R (Energy recovery)
- COF (Chip On Film)
- IPM (Intelligent Power Module)





# Introduction to Plasma

## Vertical defect (line)

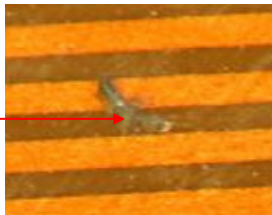
In case of 1 vertical line or short , check for foreign substances on COF connector.

First clean off the connector with clean cloth to remove foreign substances, Test again, then if the same line appears check for shorted IC, SHORTED replace panel.

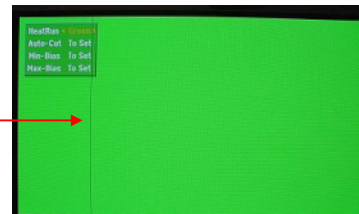
## 1 line open or short

This phenomenon is due to COF IC inside short or adherence part of the Film and rear panel electrode problem. In this case, replace the panel.

1 electrode open

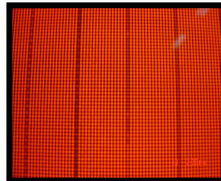
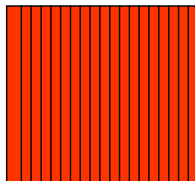


Will cause  
1 line open



## Line open or short with same distance.

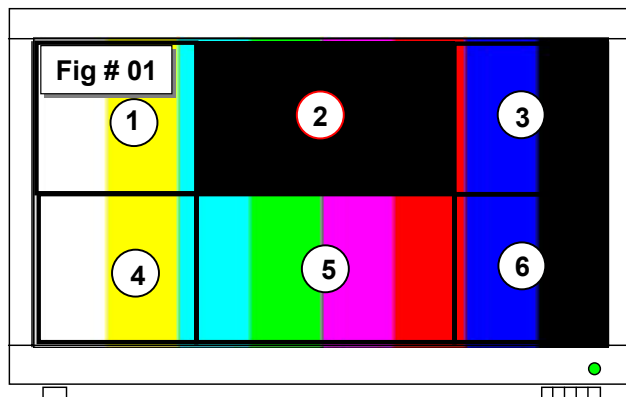
This is an ASIC of Ctrl b/d defect. ASIC defective, replace the ctrl b/d.



DA : Data Arranger IC

## No image in the specific area (see the screen location 2)

## Visual Troubleshooting



- 1) Check the related X-Board's power connector.
- 2) Check the signal cable between Controller PCB & X-Board.
- 3) Replace X-Board

### Correlation between screen & X Boards

Screen Location		X Board
1) Top left 3/10	↔	X Top-right / Bottom-left B/D
2) Center top 2/5	↔	X Center Top B/D
3) Top right 3/10	↔	X Top-left / Bottom-right B/D
4) Bottom left 3/10	↔	X Top-left / Bottom-right B/D
5) Center bottom 2/5	↔	X Center Top B/D
6) Bottom right 3/10	↔	X Top-right / Bottom-left B/D

## 2. Known Tips as to no data and partial display

### No image/ Data COF IC.

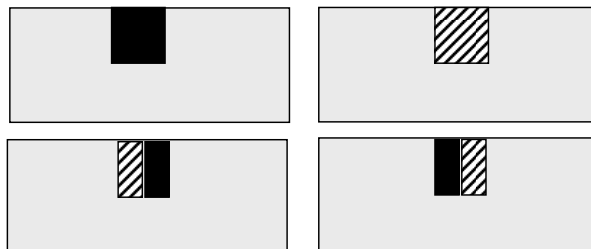
- 1) Caused by X Board's having no power or connections.

### Data COF is totally or partially not displayed

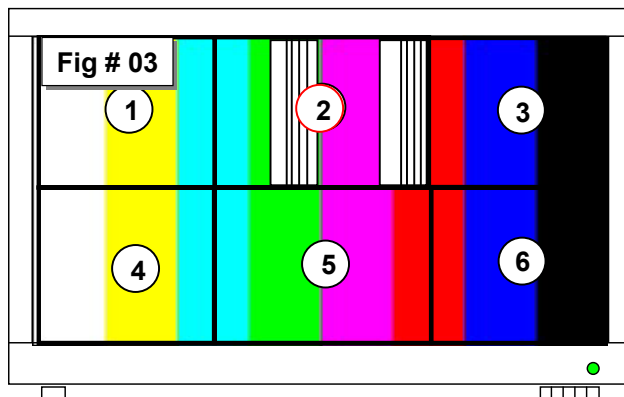
- 2) Check the connector between COF IC & X-Board.
- 3) Data COF IC is defective, replace the related X-Boards.

**Fig # 02**

Examples,



- Non-image
- Non Image white
- Partially displayed



- 1) Check the related X Board's power connector.
- 2) Check the signal cable between Controller PCB & X-Board.
- 3) Replace X-Board

### Correlation between screen & X Boards

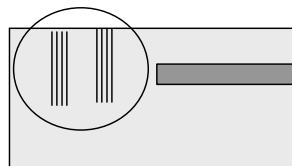
#### Screen Location

#### X Board

1) Top left 3/10	↔	X Top-right / Bottom-left B/D
2) Center top 2/5	↔	X Center Top B/D
3) Top right 3/10	↔	X Top-left / Bottom-right B/D
4) Bottom left 3/10	↔	X Top-left / Bottom-right B/D
5) Center bottom 2/5	↔	X Center Top B/D
6) Bottom right 3/10	↔	X Top-right / Bottom-left B/D

- 1) This is caused by X Board output IC being defective. When COF ICs have data this means the data transfer between the Controller PCB and X Board is missing.
- 2) Check all related X Board connections.
- 3) Replace that X Board or CTRL PCB or both if needed.

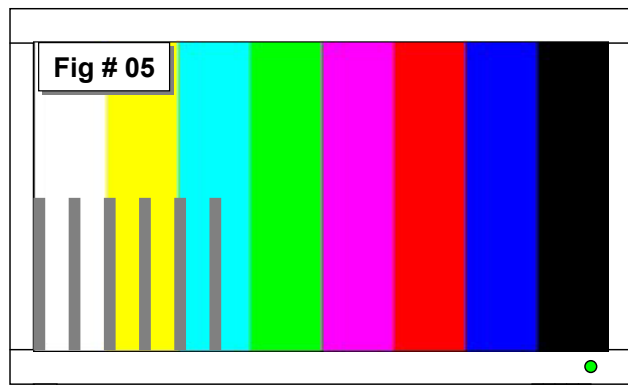
**Fig # 04**



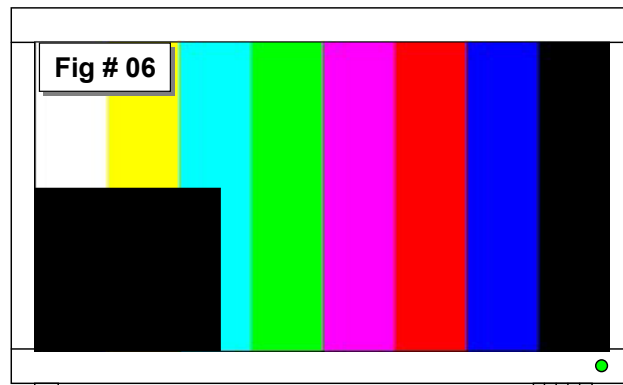
Partial error or total error with One or more ICs are defective.

## Address Bar ( Vertical ) & partial no-picture

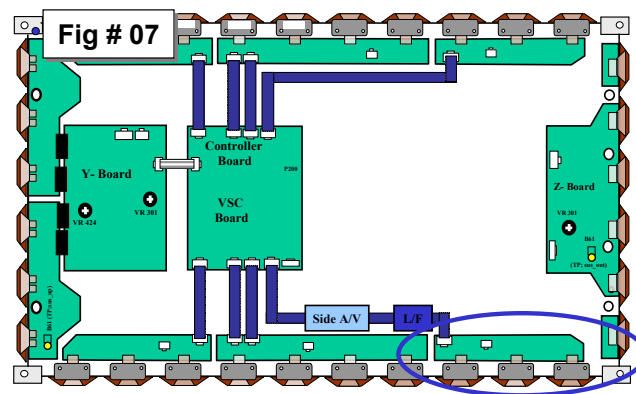
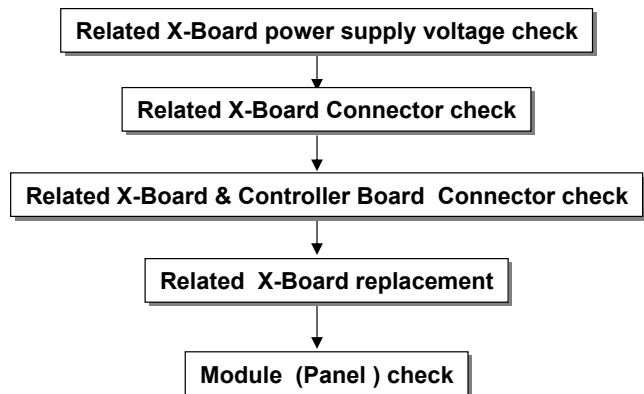
## Visual Troubleshooting



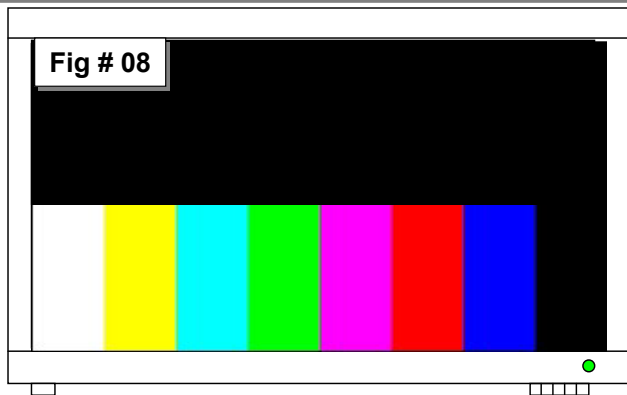
Bottom left 3/10 of the screen with vertical bar



Bottom left 3/10 of the screen with no-picture



## Bar (Horizontal) half -picture



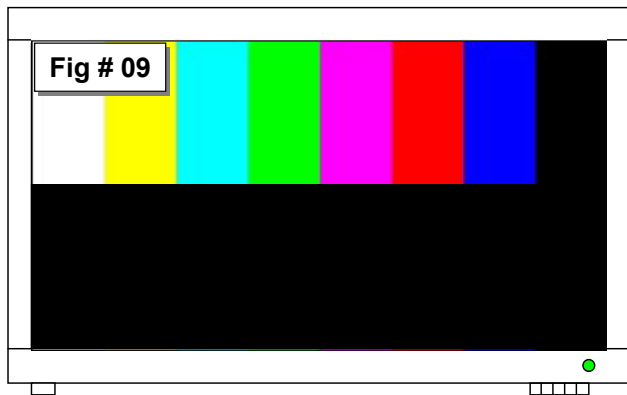
Only bottom Image is Displaying

## Visual Troubleshooting

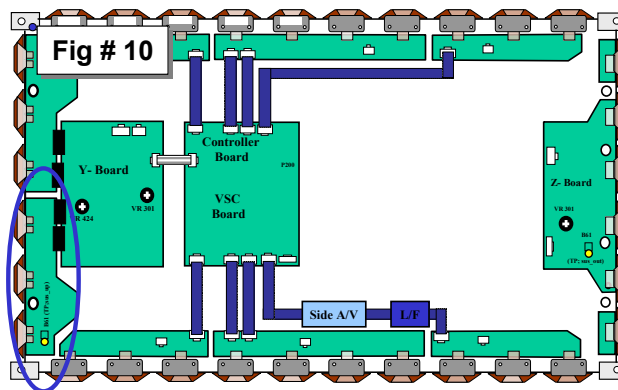
Y-Board & Y-Drive Board Connector check

Y-Drive Board ( Top ) Drive IC check

Y-Drive Board replacement

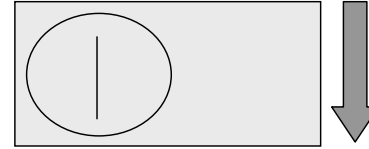


Only top Image is Displaying



### 6. One or more vertical lines in the screen.

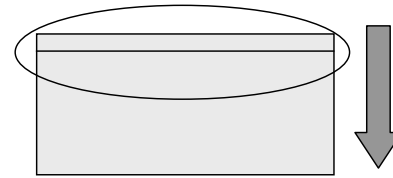
- 1) Irregular vertical line is not related to Controller PCB or X Board.
- 2) It is mainly caused by the followings open (or short).
  - Panel itself defect
  - DATA COF FPC attached to panel is open or short.
  - DATA COF attached to panel itself is defective



There can be several lines in  $\frac{1}{4}$  inch wide area.  
It can be seen on the both side, right and left.  
The area is sometimes over  $\frac{1}{4}$  inch wide.

### 7. One or more horizontal lines in the screen.

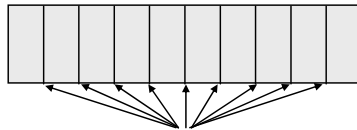
- 1) Irregular vertical line is not related to Controller PCB or Y Board.
- 2) It is mainly caused by the followings open (or short).
  - Y FPC connector  $\Rightarrow$  reinsertion
  - Open because of Y Driver Board's connector dry joint  $\Rightarrow$   
Y DRV Board replacement
  - Panel itself is defective, Y FPC attached to panel itself  
is open or short



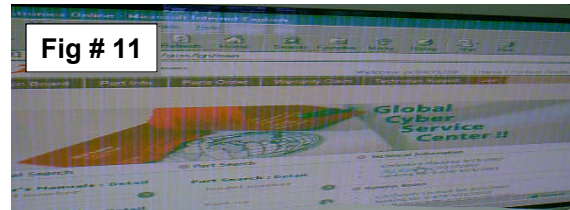
There can be several horizontal lines

### 8. Regular vertical lines in the whole screen. (mainly in one specific color, regular line is flicking)

- 1) This problem is related to CONTROL PCB.
- 2) Replace CONTROL PCB



Regular vertical lines in the whole screen

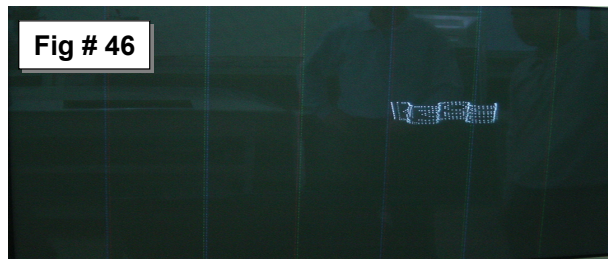


## 9. Vertical Data copy

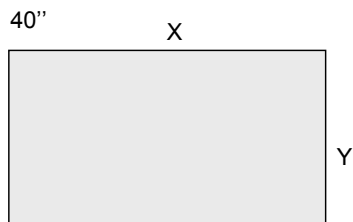
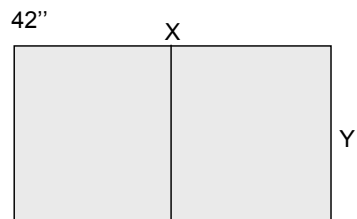
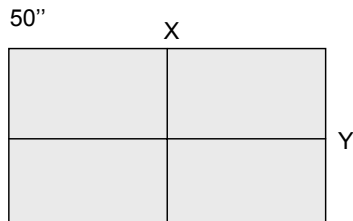
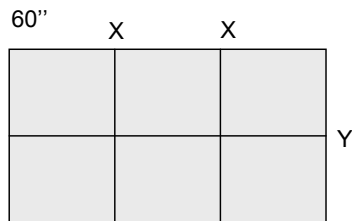
- 1) This happens when scan wave is not reproduced properly.
- 2) Replace Y-Board



<case 1 : partial Top copy >    <case2 : partial Bottom copy >



## 10. Grid X and Y Layout by screen size.



**10. Input signal pattern is displayed but the screen is dark.**

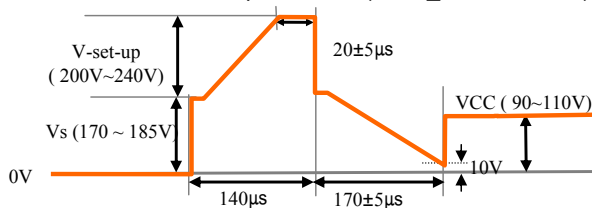
- 1) It happens when Z Board is not operating well.
- 2) Check whether Z Board's power connector is plugged properly.
- 3) Check whether the signal connector between Controller PCB & Z Board is plugged.
- 4) Replace Z Board or controller PCB.

**11. Input signal is white pattern but other colors are displayed in spots, missing data.**

- 1) Check the slope & waveform of Y Board set up, set down.
- 2) Check the slope of Z Board's ramp waveform
- 3) Measure each Board's output waveform by over 200MHz scope and reference Fig. 12 and 13.  
it is possible to control Y Board's setup slope by adjusting VR2 and Z Board's ramp slope by adjusting VR1.

**Fig # 12**

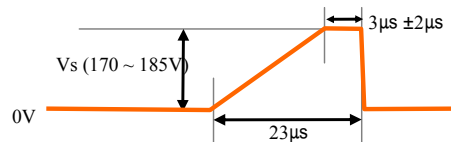
- Y B/D measurement point : B61 ( SUS\_UP OUTPUT )



< Y Sustain voltage wave >

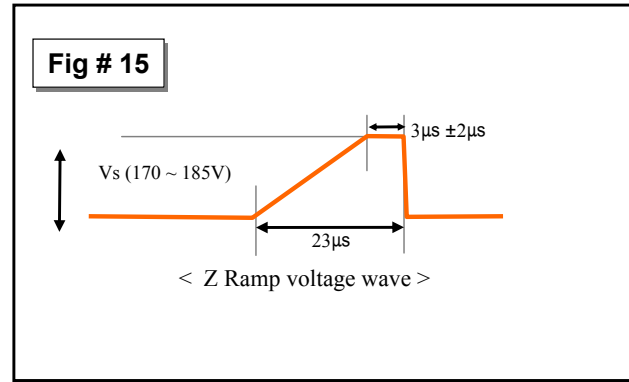
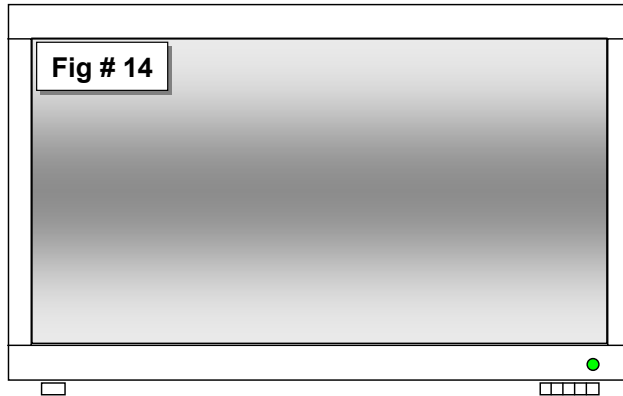
**Fig # 13**

- Z B/D measurement point : B61 ( SUS\_OUT )



< Z Ramp voltage wave >



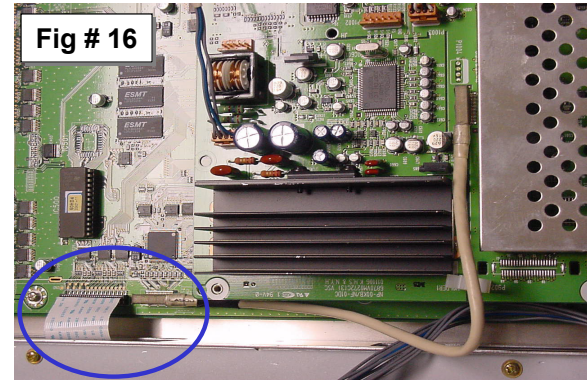


**13. A specific brightness of one color is not clear.**

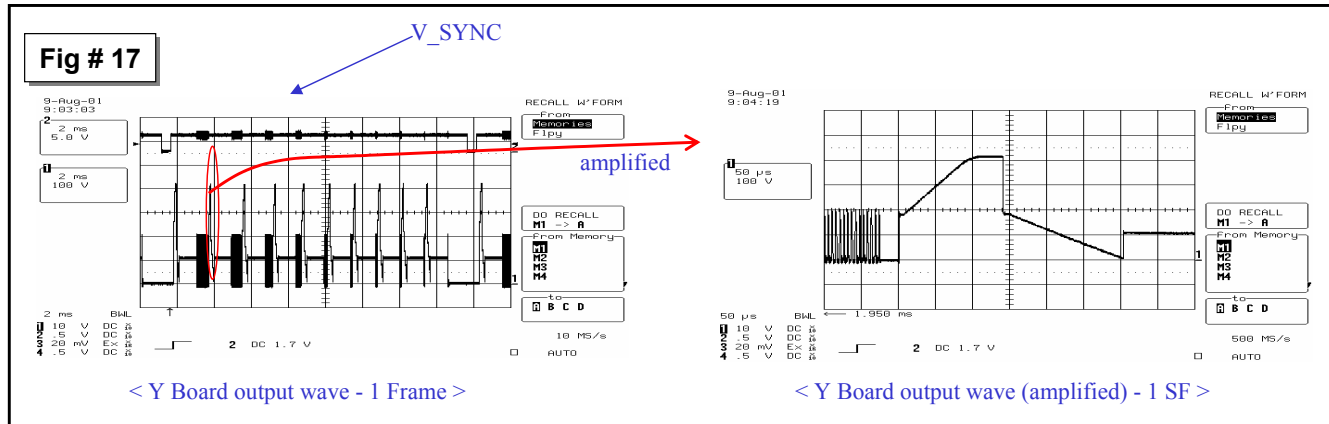
- 1) Check CTRL Board's input signal connector.
- 2) Replace CTRL Board.

**14. With a full white pattern, the picture is darker toward the center.**

- 1) Dark picture will occur when the Z-board is missing its ramp waveform/ see Fig # 15
- 2) Check the connection between CTRL PCB and the Z-board signal cable.
- 3) If the signal cable is -OK- Replace the Z-Board.

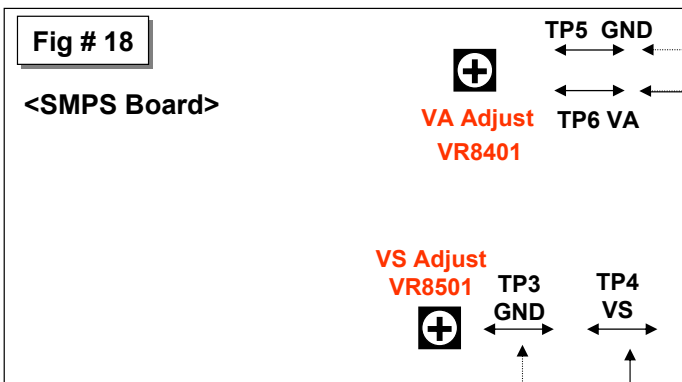


- 1) Check CTRL PCB's LED (D1~ D4).
- 2) Check the power or signal cable inputting into CTRL PCB.
- 3) Check X Board, Y Board and Z Board's power connector.
- 4) Check the connector between CTRL PCB, X Board, Y Board, and Z Board respectively.
- 5) Measure Y Board's output waveform with over 200MHz oscilloscope and compare it to Fig 17 below.
  - Y Board measurement point : ( SUS\_UP OUTPUT )
  - X Board measurement point : ( SUS\_DN OUTPUT )
- 6) Test data X Board waveform @ COF IC See Fig 34 page 26.
- 7) No Signal - Replace Controller PCB

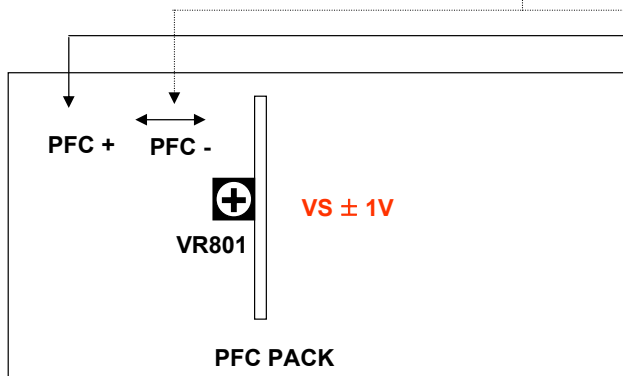
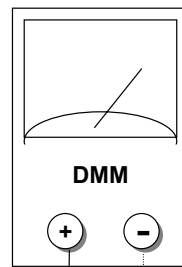


## Voltage Adjustment

## Service Adjustment



**When replacing power board,  
Be sure to follow Power Assembly voltage Proc.**



### 1. PFC adjustment

- Select 100% White Pattern signal and Pre-Heat panel.
- Connect DMM with TP PFC+ and TP PFC – (GND).
- adjust VR801 to 380V (within  $\pm 1V$ ).

### 2. VA adjustment

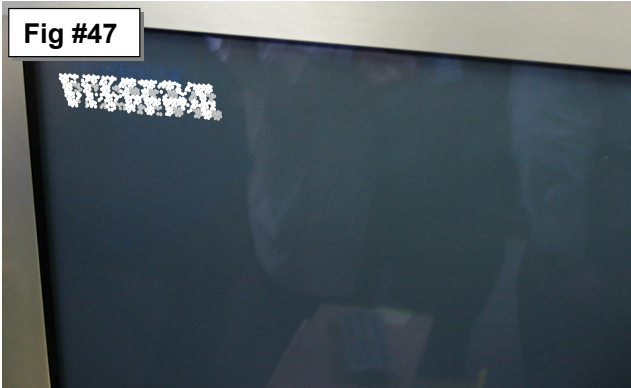
- Connect DMM + terminal with P814 #1 Pin.
- Turn VR8401 (VA) to adjust the voltage on DMM to VA voltage value marked on label @ bottom- right of panel. (allowable tolerance :  $\pm 0.5V$  )

### 3. VS adjustment

- Connect DMM's + terminal with P803 # 9 Pin.
- Turn VR 8501 (VS) to adjust the voltage with DMM to Vs voltage value marked on label @ bottom- right of panel.

## Voltage Adjustment

Fig #47



## Service Adjustment

Fig # 48

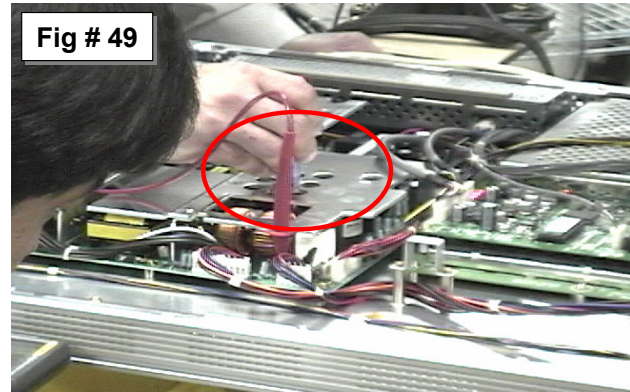


**Problem:** The picture above is an example of distorted text.

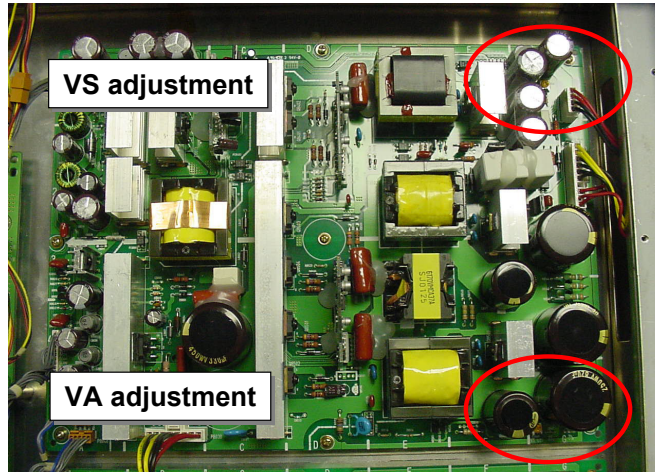
**Cure:** **VA & VS** voltage adjustment is needed when the following items are found:

- Distorted text
- Blocked text
- Pixilated picture
- Dots running from side to side
- Tearing in the picture
- Video smear

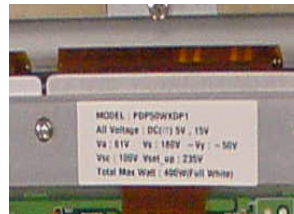
Fig # 49



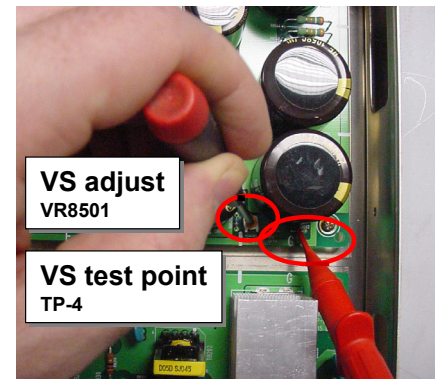
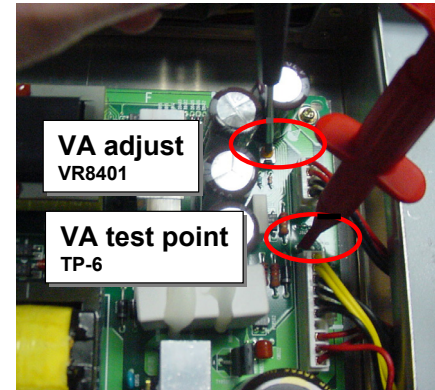
## 60" Test points and voltage adjustments.



The voltage settings change from model to model and are labeled and located at the top center of the screen.



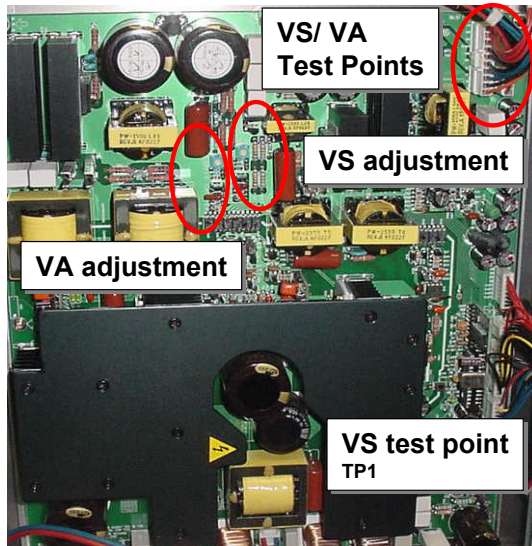
## Service Adjustment



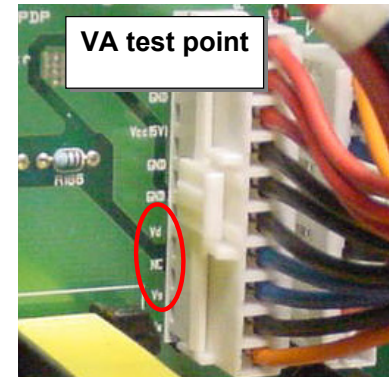
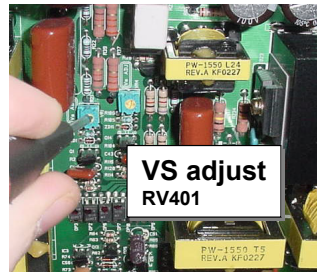


## 50"- 26 series Test points and voltage adjustments.

## Service Adjustment

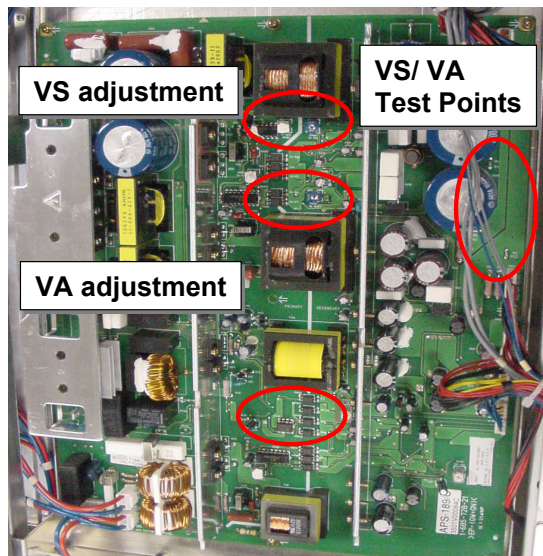


The voltage settings change from model to model and are labeled and located at the top center of the screen.

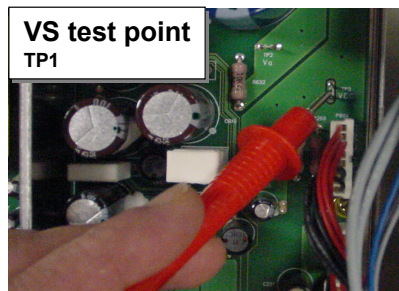
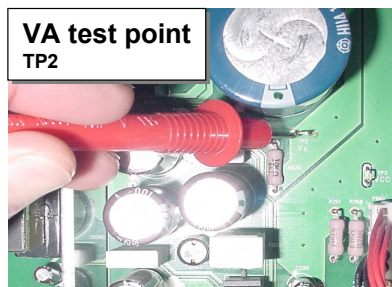
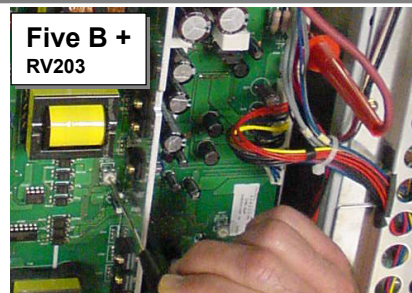
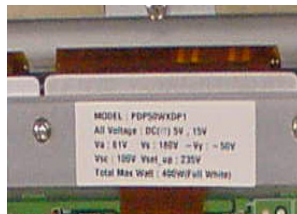


## 50"- 28 Series Test points and voltage adjustments.

## Service Adjustment



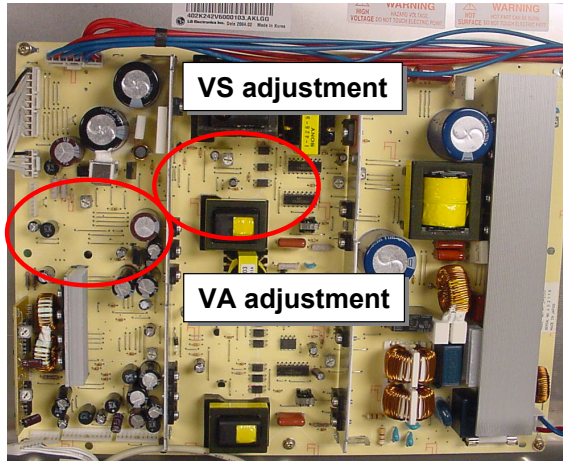
The voltage settings change from model to model and are labeled and located at the top center of the screen.



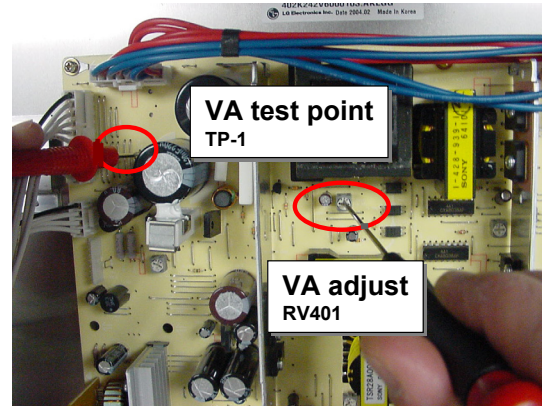
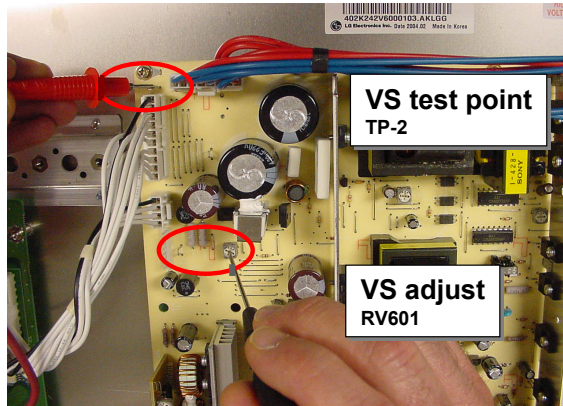
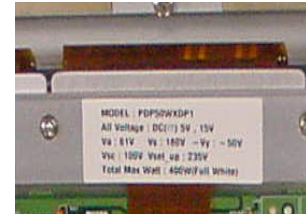


42" with tuner test points and voltage adjustments.

## Service Adjustment



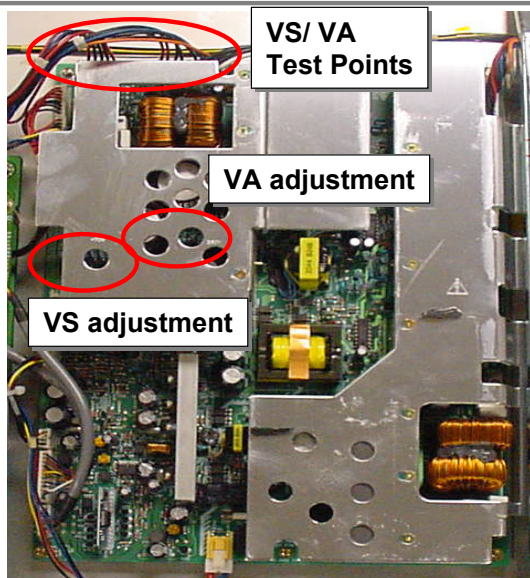
The voltage settings change from model to model and are labeled and located at the top center of the screen.



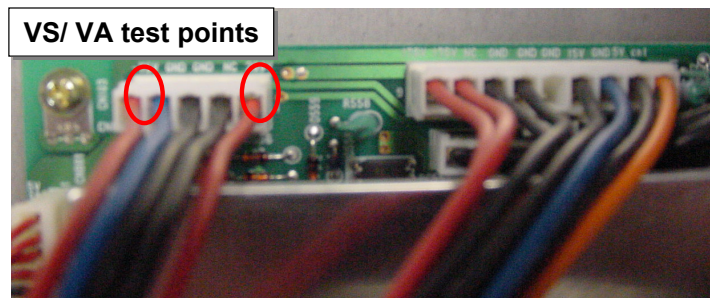
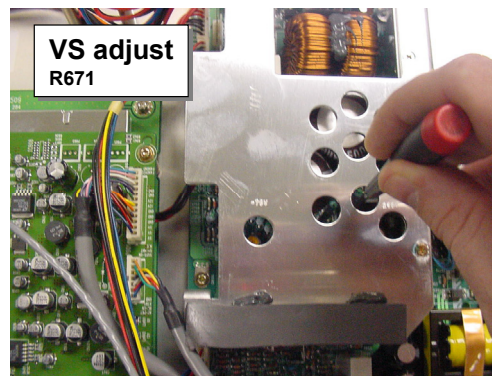
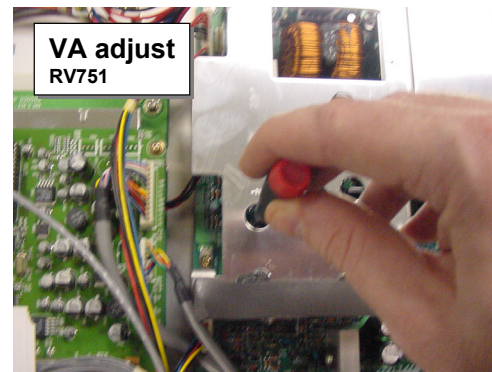
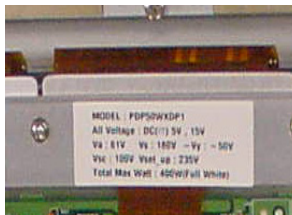


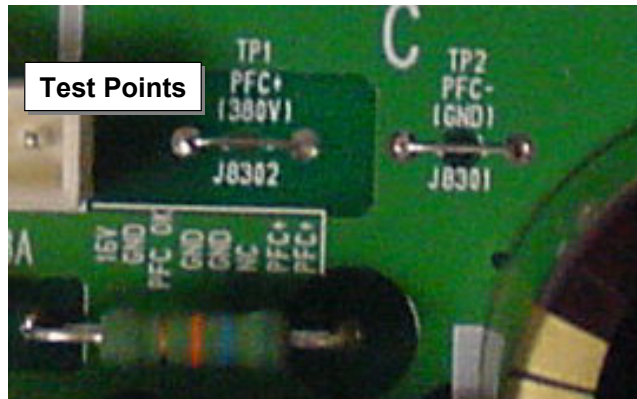
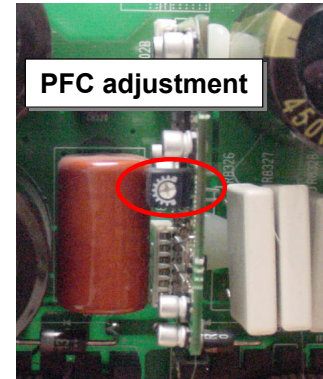
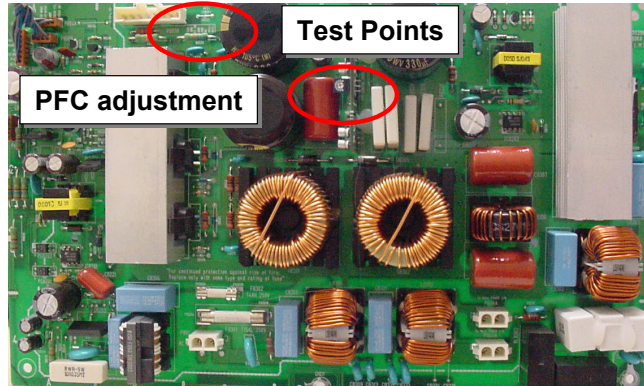
42" early model, Test points and voltage adjustments.

## Service Adjustment



The voltage settings change from model to model and are labeled and located at the top center of the screen.





Pulse Frequency - Coefficient (PFC) adjustment is Located the primary supply and is for aligning grid voltage. The panels grid voltage averages 360 to 380 volts depending on panel circuit.

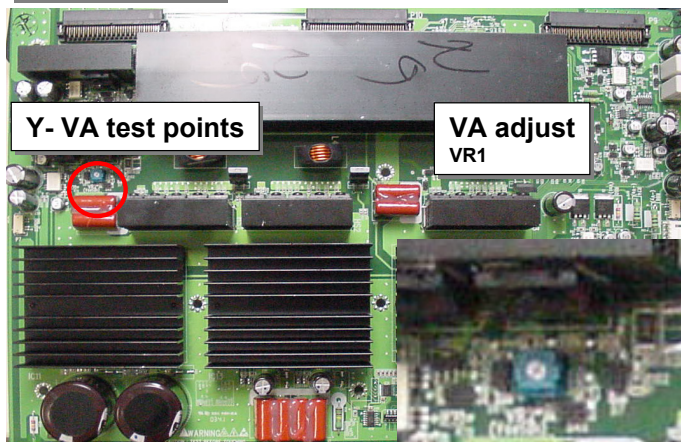
### Known symptoms:

1. Intermittent Power
2. Picture dimming to bright during certain scenes
3. Primary colors off, Hue or flesh tones
4. Colors bleeding
5. Left to Right picture is dark to bright

## Y-amp, Test points and voltage adjustments.

## Service Adjustment

6871QYH023A / Example 60''



6871QYH027A / Example 42''

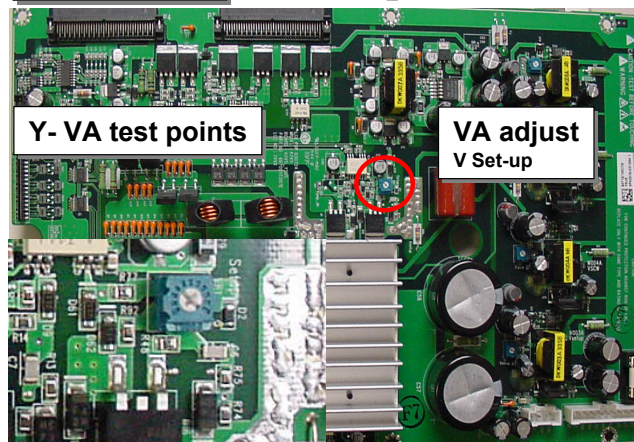
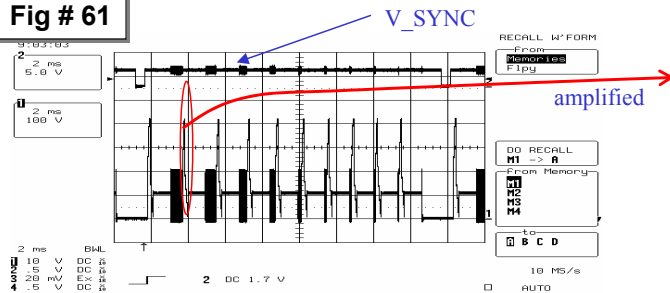
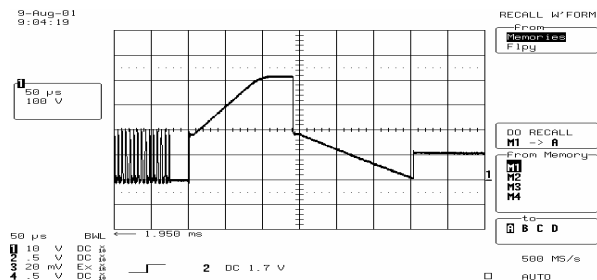


Fig # 61



< Y Board output wave - 1 Frame >

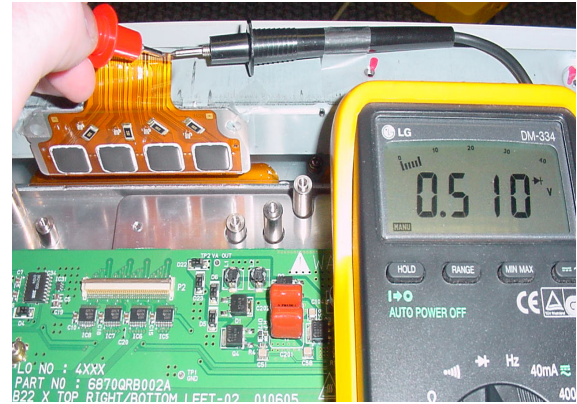
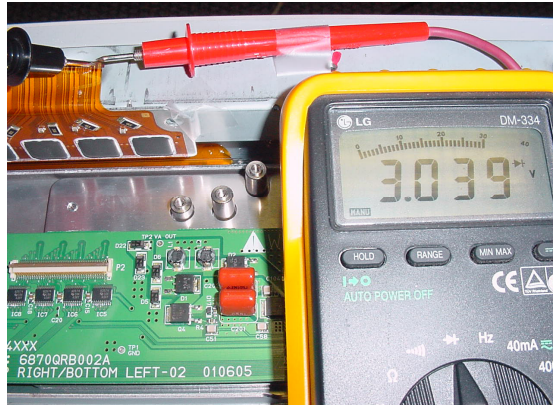


< Y Board output wave (amplified) - 1 SF >

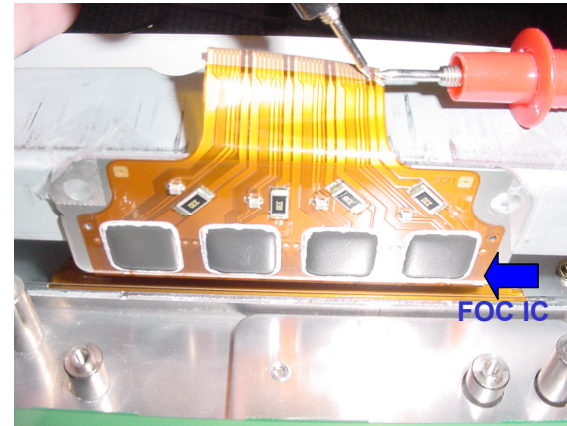


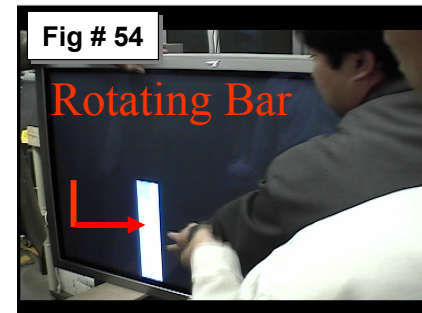
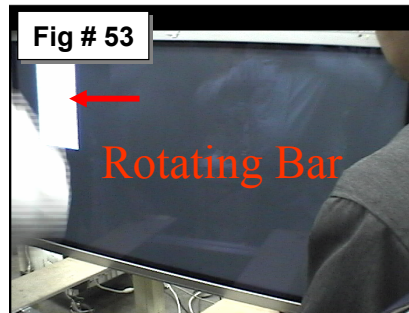
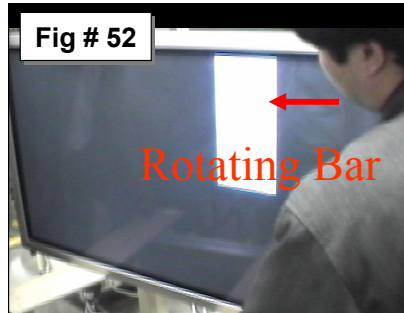
## Service Adjustment



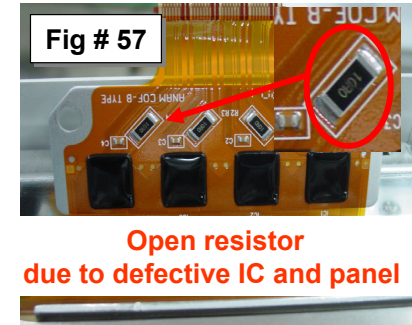
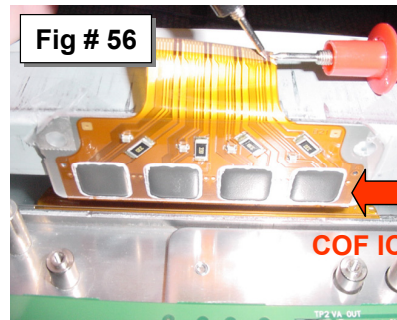
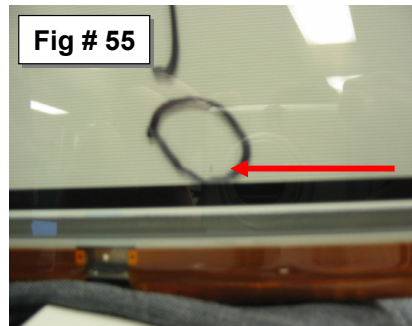


If an X-Board is found defective there is a slim possibility that the panel could cause the new X-Board Installed to fail due to panel short test by performing Diode Check as in the above figures.





If an X-Board is found defective there is a slim possibility that a pixel could be found defective in the responsible quadrant. This is caused by an arch in the panel caused at the point of the IC's failure.



The above FIGURE 55 shows the defective cell damage. Figure 56 shows the panel ribbon attached to panel. We identified that for this panel the ribbons integrated IC was shorted.

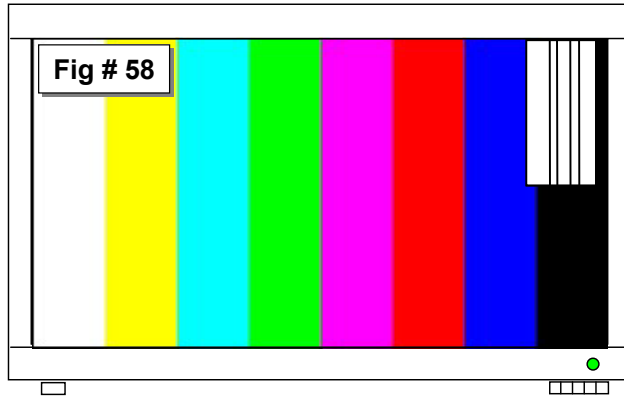
Note: In figure 55 is 1 defective cell this is caused by an arch in the panel, this caused COF IC too short.



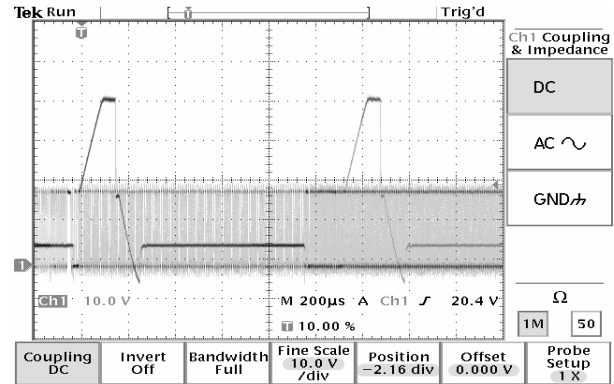
## Testing Y driver board for problems/ Example 50".

## Panel Testing

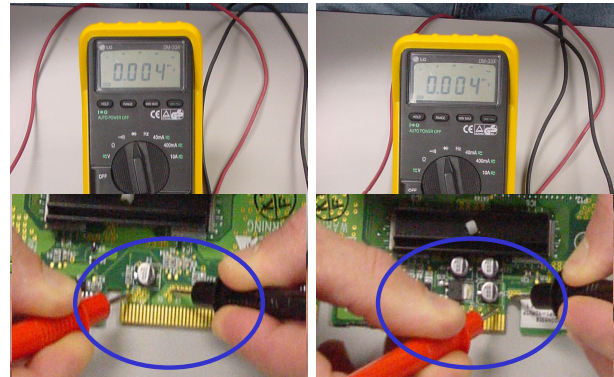
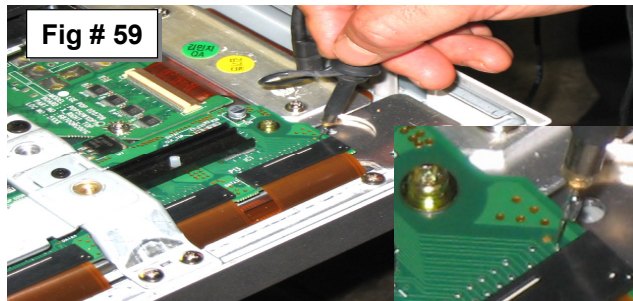
- 1) Problem occurs when IC shorts and loss of signal to panel.
- 2) Check the con. between CTRL & Z Board's signal cable.

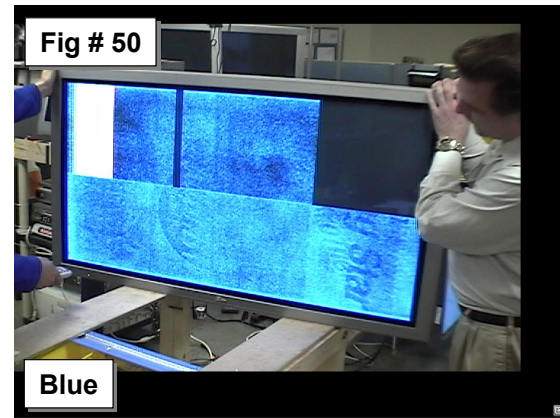
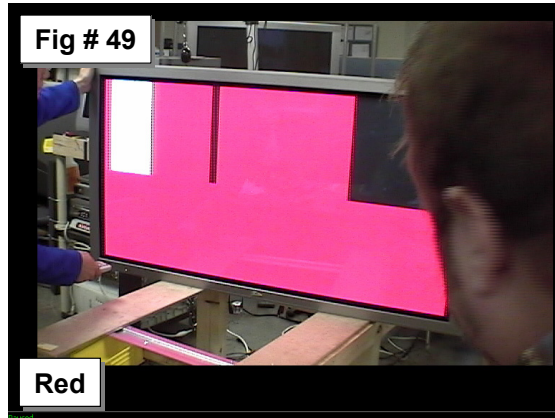


### 5) Sustain-up Waveform example



- 3) The following image is the test point for waveform.
- 4) To the right is two test points for shorted IC's 50".





Most etching can be identified by using a Green/ Blue or Red background and by adjusting the intensity down. If the one color is displayed that CAUSED the etching the color will be low in intensity compared to the rest of the screen.

Etching considerations for extreme cases you need to run white balance or heat run in 6 hour increments up to 24 hours. If you can't perform a proper white balance after 24 hours the panel is not within spec and the panel will not work/ display properly.





## Etching Correction (Activating Heat Run) for Defective Panel

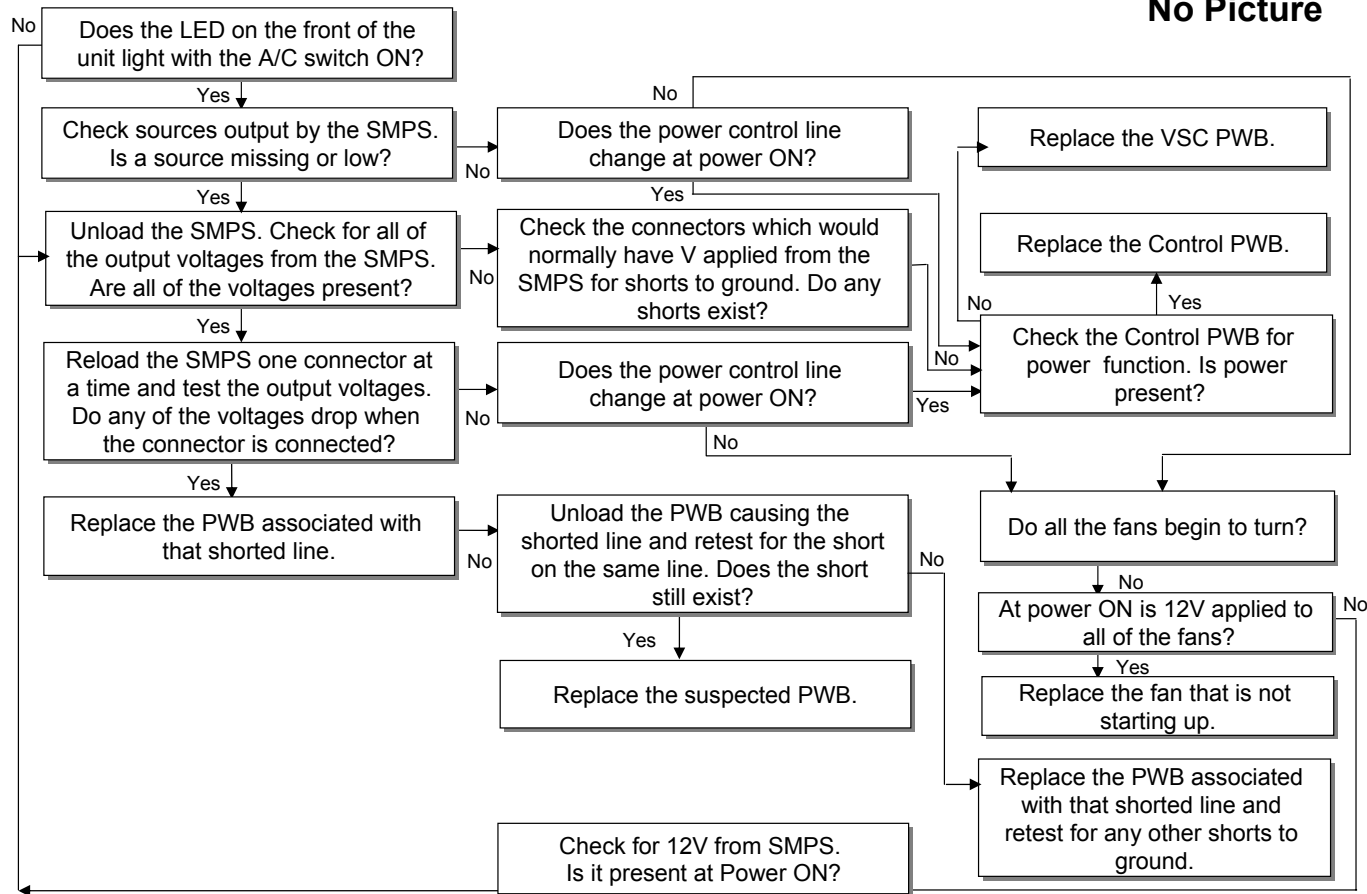
## Panel Testing

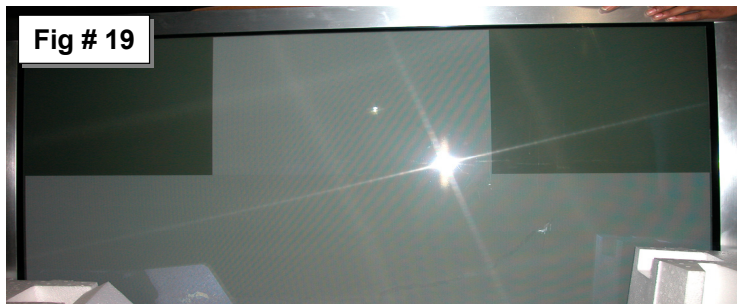
To enter in to White Balance (Heat Run), Press Power On (1). Then, press adjust right (2) to activate Blue, Green and Red. With the Heat run activated on White Balance run for 6 hours and check color background by pressing adjust right (2) for testing picture quality. Complete and repeat if needed not to exceed 24 hours.



## Troubleshooting

## Power Section No Picture





Control Board & Y-Driver Amp

Check & Adjust: PFC / VS / VA voltages to panel specifications



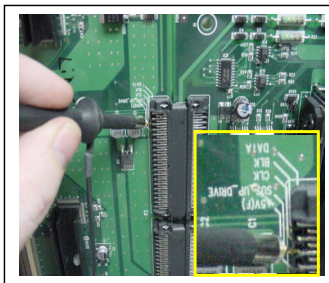
Check Y-Sustain Sub-amp wave form



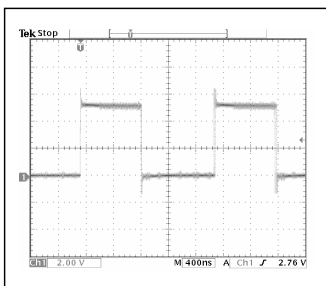
Okay? Replace Y-Sustain Amp



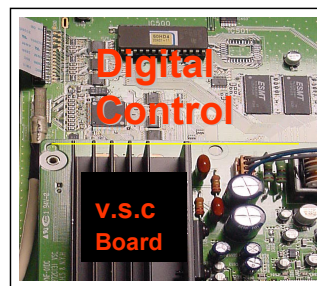
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board



Y- Amp

Check & Adjust: PFC / VS / VA voltages to panel specifications



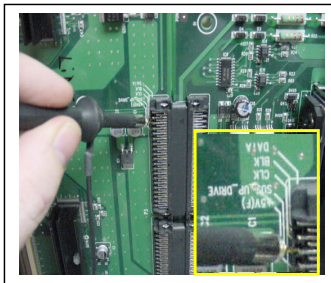
Check Y-Sustain Sub-amp wave form



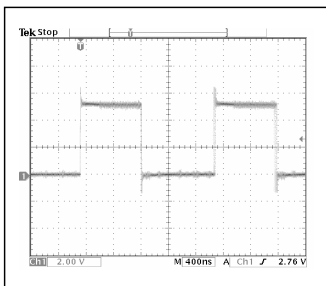
Okay? Replace Y-Sustain Amp



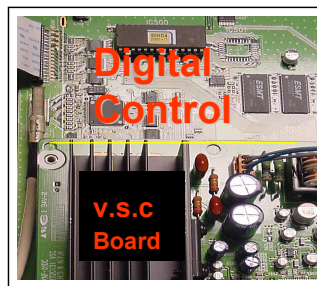
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board



Y-Driver Amp

Check & Adjust: PFC / VS / VA voltages to panel specifications



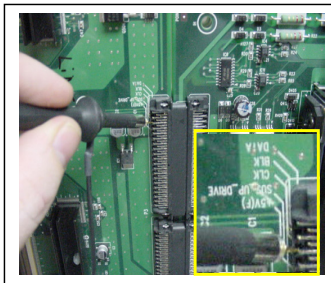
Check Y-Sustain Sub-amp wave form



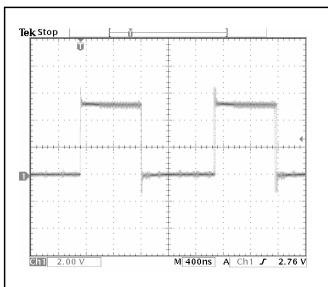
Okay? Replace Y-Sustain Amp



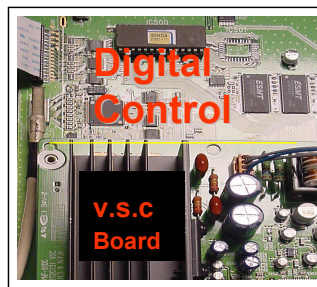
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board

## 60" Known Visual problems with boards that fixed

## Visual Problems



Y-Driver Top

Check & Adjust: PFC / VS / VA voltages to panel specifications



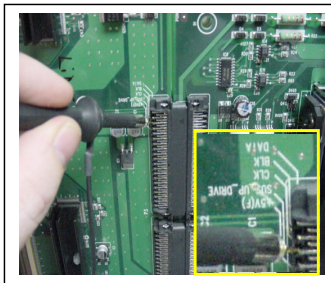
Check Y-Sustain Sub-amp wave form



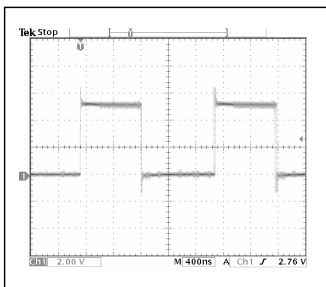
Okay? Replace Y-Sustain Amp



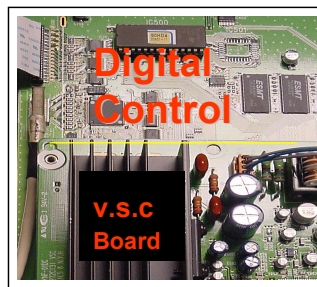
Not Resolved? Replace Digital Control board



Y Sustain WF test point

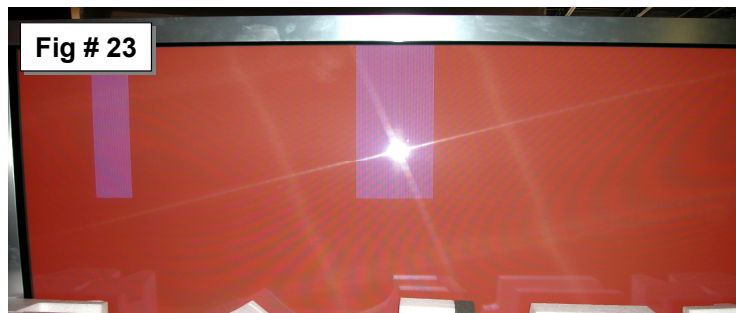


Y Sustain WF



Digital Control board





Digital Control Board

Check & Adjust: PFC / VS / VA voltages to panel specifications



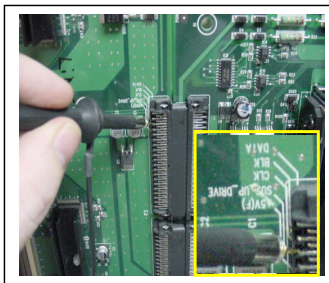
Check Y-Sustain Sub-amp wave form



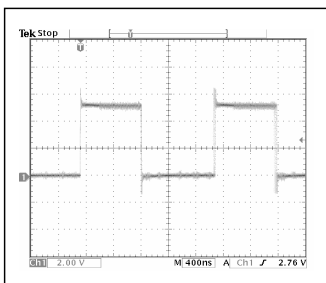
Okay? Replace Y-Sustain Amp



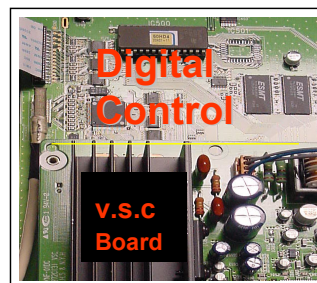
Not Resolved? Replace Digital Control board



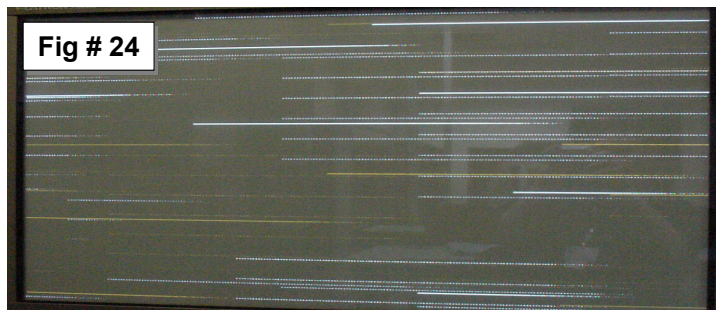
Y Sustain WF test point



Y Sustain WF



Digital Control board



Y-Driver Bottom

Check & Adjust: PFC / VS / VA voltages to panel specifications



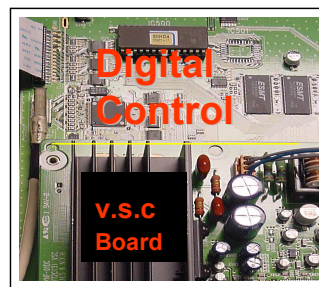
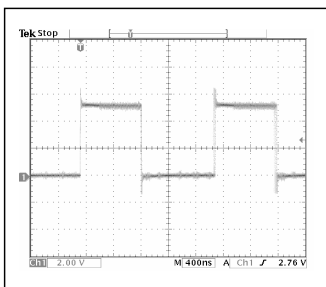
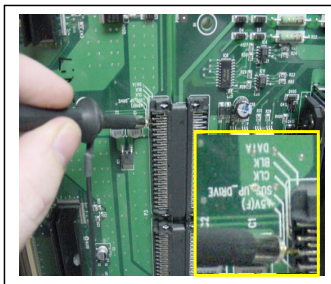
Check Y-Sustain Sub-amp wave form



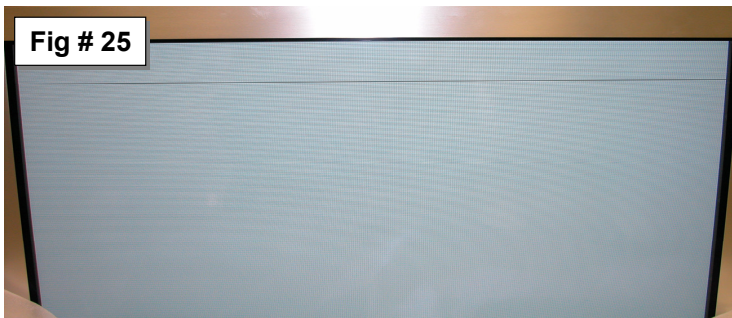
Okay? Replace Y-Sustain Amp



Not Resolved? Replace Digital Control board







Y-Driver - Top

Check & Adjust: PFC / VS / VA voltages to panel specifications



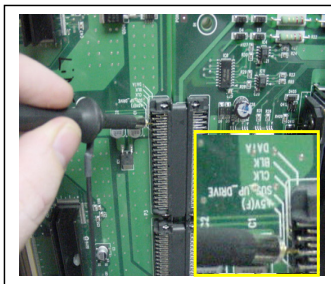
Check Y-Sustain Sub-amp wave form



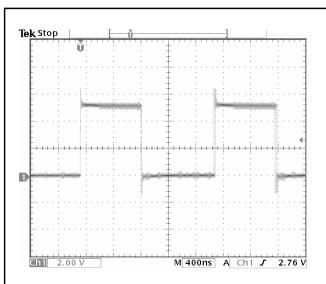
Okay? Replace Y-Sustain Amp



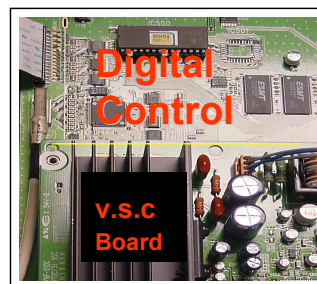
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board

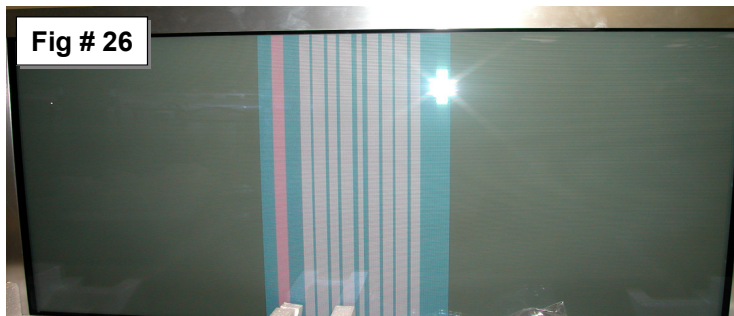


Fig # 26

VSC- Board

Check & Adjust: PFC / VS / VA voltages to panel specifications



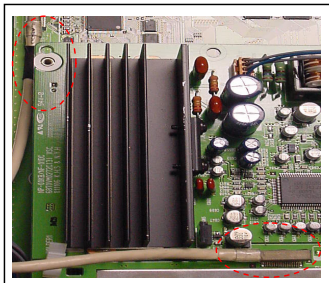
Check Connection VSC and Digital board



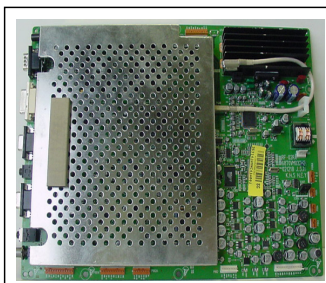
Okay? Replace VSC board



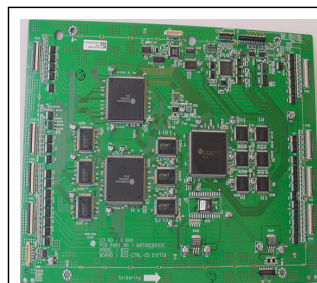
Not Resolved? Replace Digital board



VSC to Digital cable



VSC Board



Digital Control



Y-Driver - Top

Check & Adjust: PFC / VS / VA voltages to panel specifications



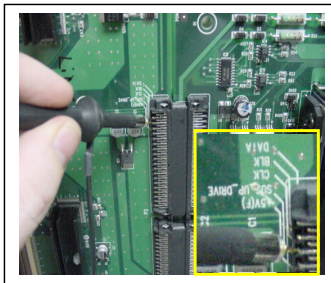
Check Y-Sustain Sub-amp wave form



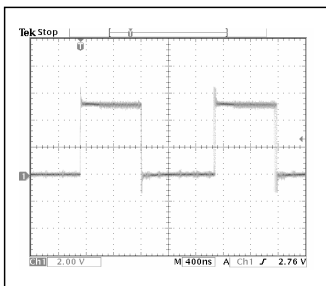
Okay? Replace Y-Sustain Amp



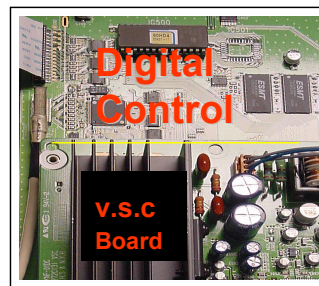
Not Resolved? Replace Digital Control board



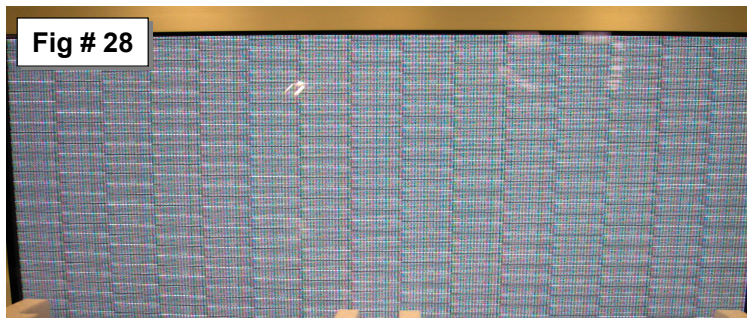
Y Sustain WF test point



Y Sustain WF



Digital Control board



VSC- Board

Check & Adjust: PFC / VS / VA voltages to panel specifications



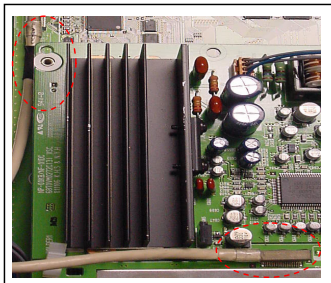
Check Connection VSC and Digital board



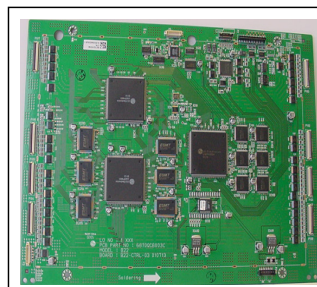
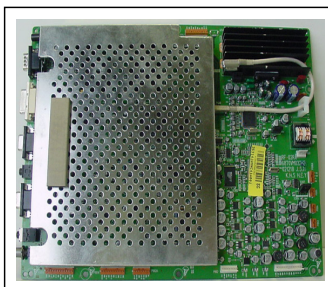
Okay? Replace VSC board



Not Resolved? Replace Digital board



VSC to Digital cable







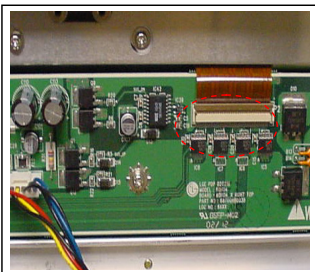
X- Board ( Top Right)

Check & Adjust: PFC / VS / VA voltages to panel specifications

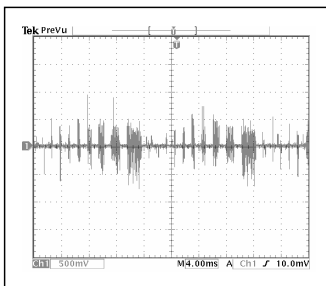
Check X-board wave form

Okay? Replace X-Board

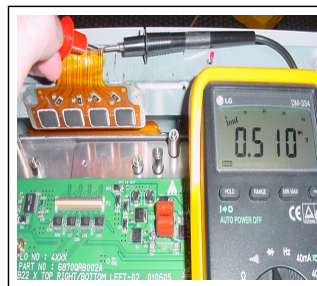
Not Resolved? Check for C.O.F IC Short



X-Board WF test point



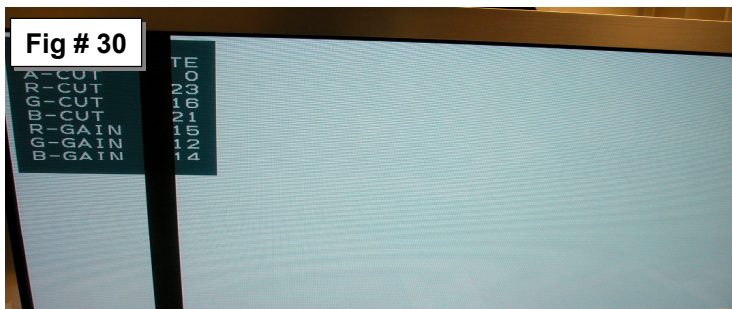
ER down X- board



C.O.F IC test 4 Defective Panel

## 42" Known Visual problems with boards that fixed

## Visual Problems



X-Drive Board

Check & Adjust: PFC / VS / VA voltages to panel specifications



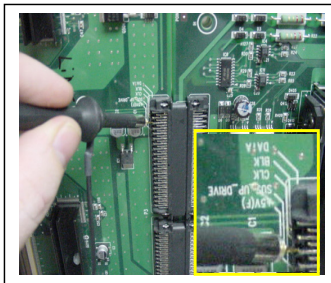
Check Y-Sustain Sub-amp wave form



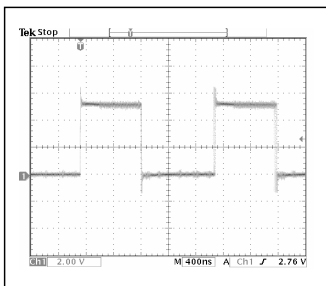
Okay? Replace Y-Sustain Amp



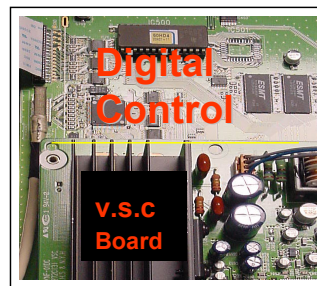
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF

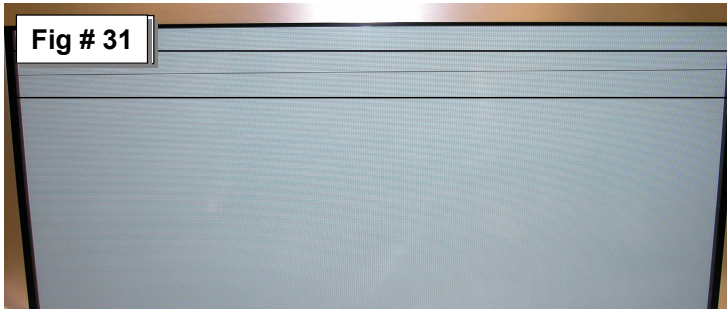


Digital Control board



## 50" Known Visual problems with boards that fixed

## Visual Problems



Y-Driver Amp upper

Check & Adjust: PFC / VS / VA voltages to panel specifications



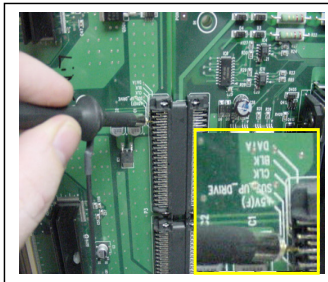
Not okay, Check Y-Sustain Sub-amp wave form



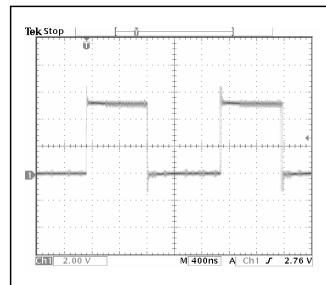
Okay, Replace Y-Sustain Amp



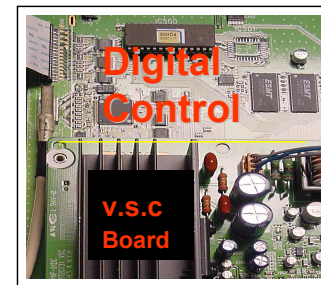
Not okay. Replace Digital Control board



Y Sustain WF test point



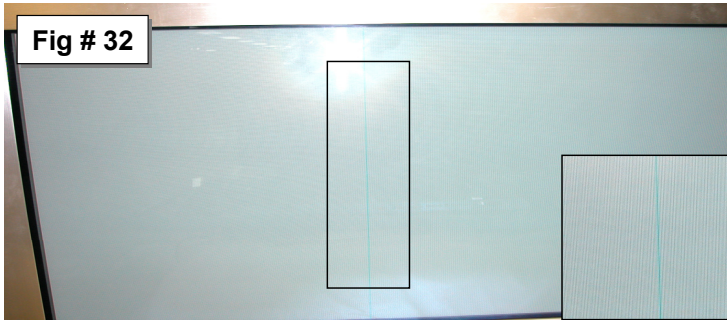
Y Sustain WF



Digital Control board

## 50'' Known Visual problems with boards that fixed

## Visual Problems



Digital Control board

Check & Adjust: PFC / VS / VA voltages to panel specifications



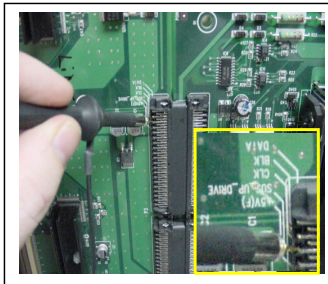
Check Y-Sustain Sub-amp wave form



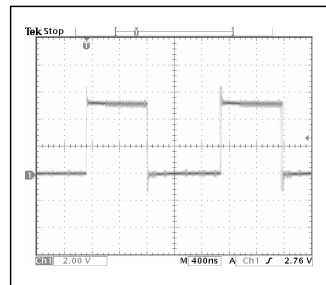
Okay? Replace Y-Sustain Amp



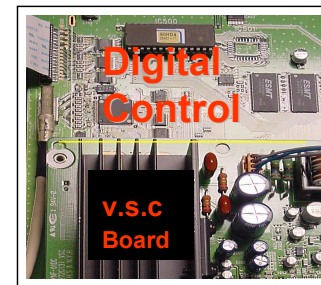
Not Resolved? Replace Digital Control board



Y Sustain WF test point



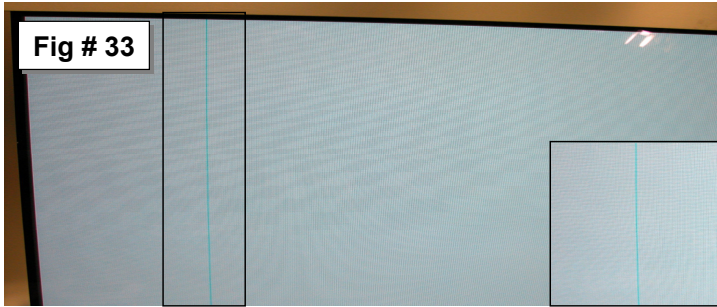
Y Sustain WF



Digital Control board

## 50" Known Visual problems with boards that fixed

## Visual Problems



Digital Control Board

Check & Adjust: PFC / VS / VA voltages to panel specifications



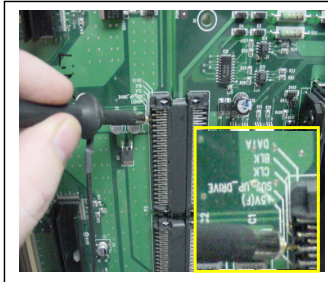
Check Y-Sustain Sub-amp wave form



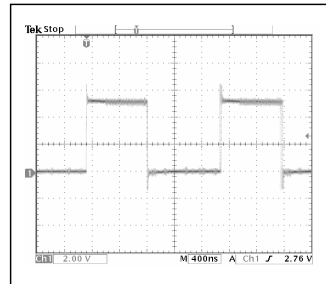
Okay? Replace Y-Sustain Amp



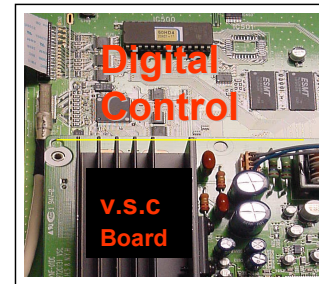
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board

## 50'' Known Visual problems with boards that fixed

## Visual Problems



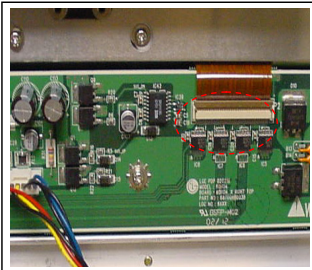
VSC Board

Check & Adjust: PFC / VS / VA voltages to panel specifications

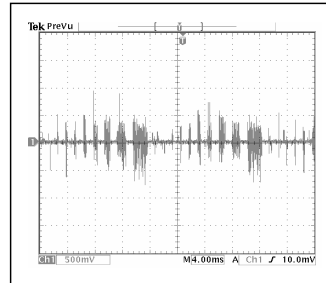
Check X-board wave form

Okay? Replace X-Board

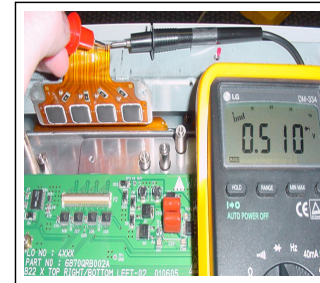
Not Resolved? Check for C.O.F IC Short



X-Board WF test point



ER down X- board



C.O.F IC test 4 Defective Panel



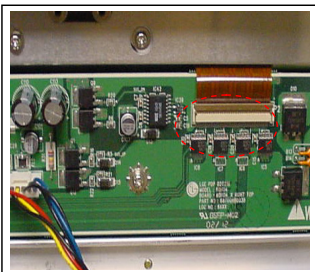
X-Board upper right

Check & Adjust: PFC / VS / VA voltages to panel specifications

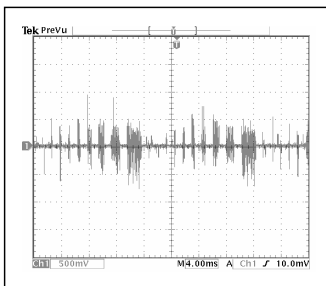
Check X-board wave form

Okay? Replace X-Board

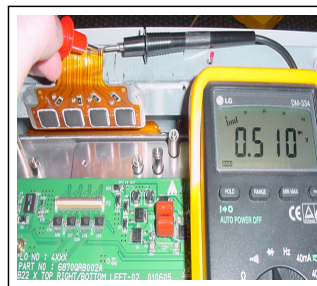
Not Resolved? Check for C.O.F IC Short



X-Board WF test point



ER down X- board



C.O.F IC test 4 Defective Panel



## 50" Known Visual problems with boards that fixed

## Visual Problems



Y- Driver Amp bottom

Check & Adjust: PFC / VS / VA voltages to panel specifications



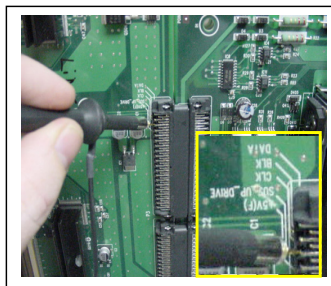
Check Y-Sustain Sub-amp wave form



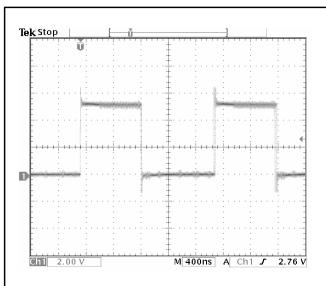
Okay? Replace Y-Sustain Amp



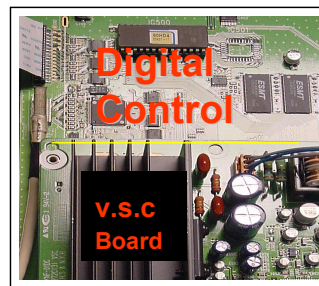
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board



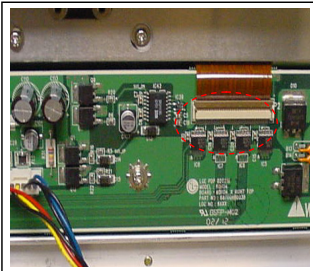
X- Board ( Bottom Left)

Check & Adjust: PFC / VS / VA voltages to panel specifications

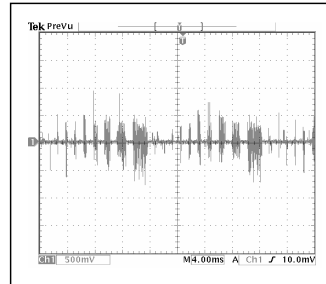
Check X-board wave form

Okay? Replace X-Board

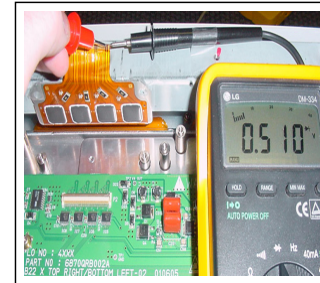
Not Resolved? Check for C.O.F IC Short



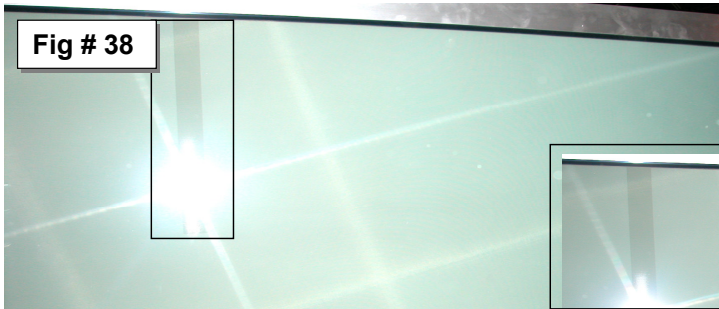
X-Board WF test point



ER down X- board



C.O.F IC test 4 Defective Panel



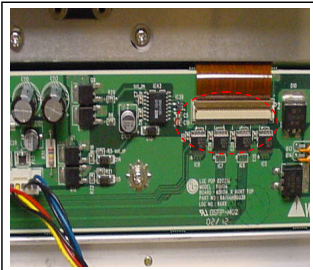
X- Board ( Upper Right)

Check & Adjust: PFC / VS / VA voltages to panel specifications

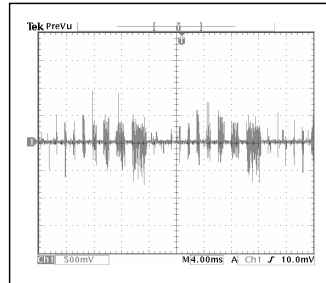
Check X-board wave form

Okay? Replace X-Board

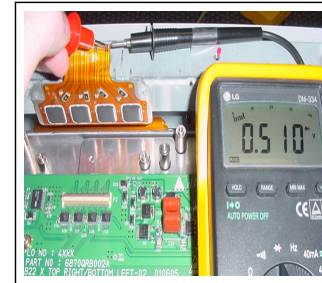
Not Resolved? Check for C.O.F IC Short



X-Board WF test point



ER down X- board



C.O.F IC test 4 Defective Panel

## 50'' Known Visual problems with boards that fixed

## Visual Problems



Digital Control Board

Check & Adjust: PFC / VS / VA voltages to panel specifications



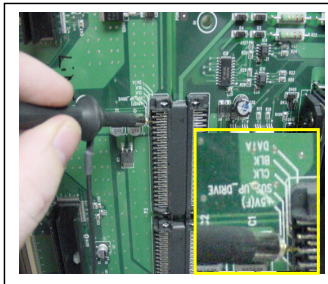
Check Y-Sustain Sub-amp wave form



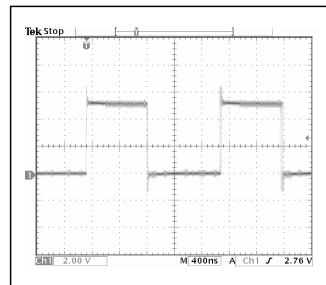
Okay? Replace Y-Sustain Amp



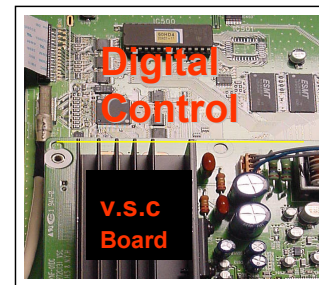
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board



## Y- Driver Bottom

**Check & Adjust: PFC / VS / VA voltages to panel specifications**



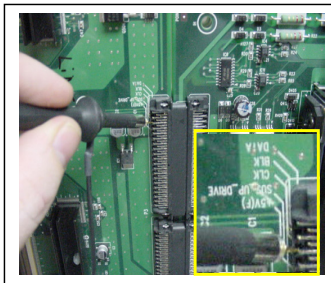
### Check Y-Sustain Sub-amp wave form



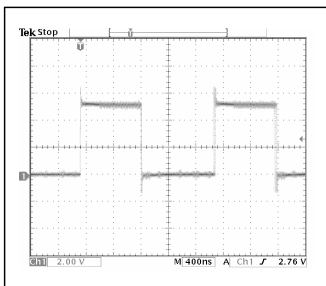
**Okay? Replace Y-Sustain Amp**



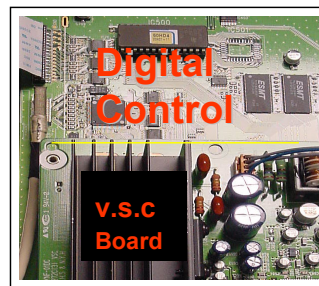
### Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



## Digital Control board



## 50'' Known Visual problems with boards that fixed

## Visual Problems



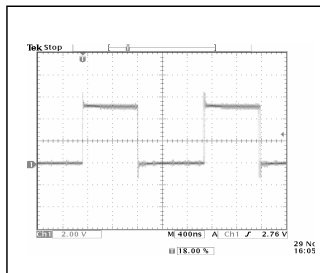
X-Drive Top

Check & Adjust: PFC / VS / VA voltages to panel specifications 61

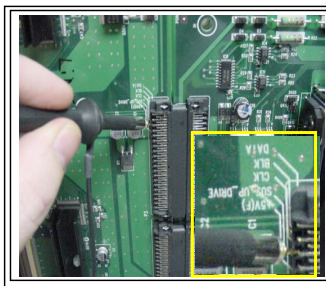
Check X-Board waveform

Okay? Check for C.O.F IC Short

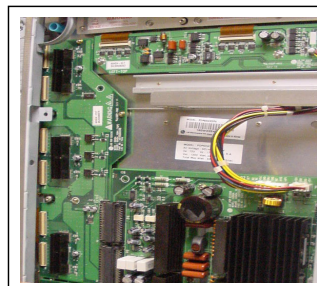
Shorted? Defective Panel



Y Sustain WF



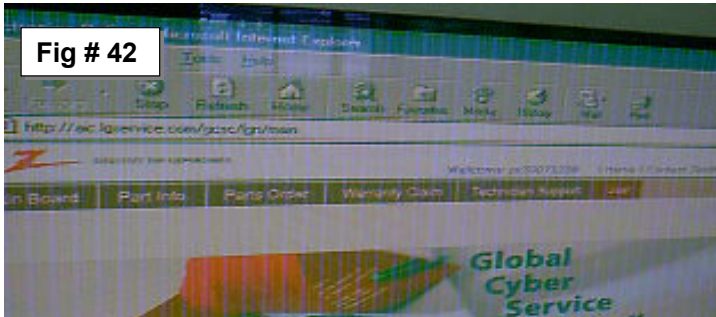
Y Sustain WF test point



Y Sustain Sub-Amp board

## 50'' Known Visual problems with boards that fixed

## Visual Problems



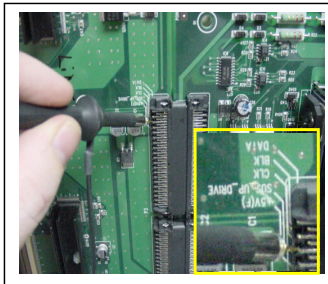
Digital Control Board

Check & Adjust: PFC / VS / VA voltages to panel specifications

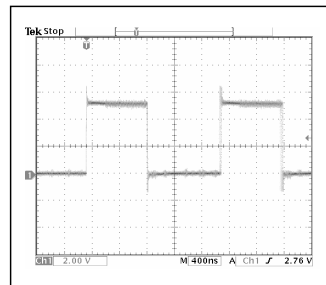
Check Y-Sustain Sub-amp wave form

Okay? Replace Y-Sustain Amp

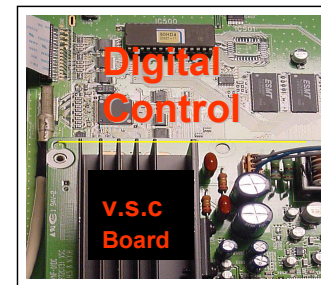
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board

## Known Visual problems & found panel defective

## Visual Problems



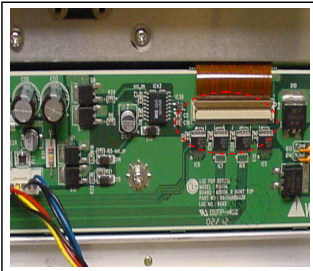
C.O.F IC – Ribbon shorted/ Part of Panel  
Defective Panel

Check & Adjust: PFC / VS / VA voltages to panel specifications

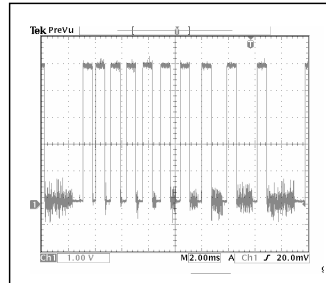
Check X-Board waveform

Okay? Check for C.O.F IC Short

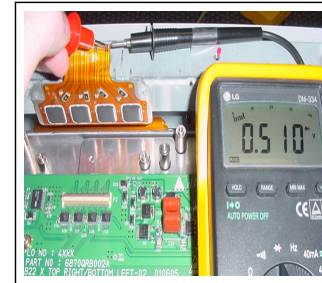
Shorted? Defective Panel



X-Board WF test point



X-Board Sustain WF



C.O.F IC test 4 Defective Panel



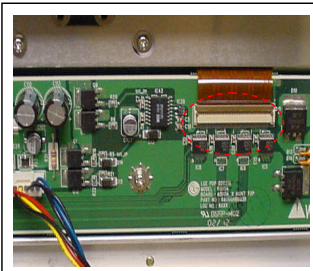
Data @ X-Board – Yes/ tested for shorted  
C.O.F IC – Ribbon shorted/ Defective Panel

Check & Adjust: PFC / VS / VA voltages to panel specifications

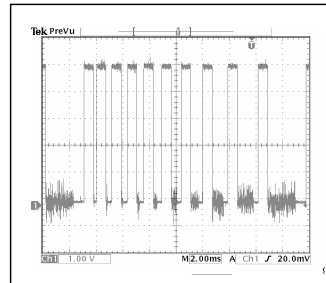
Check X-Board waveform

Okay? Check for C.O.F IC Short

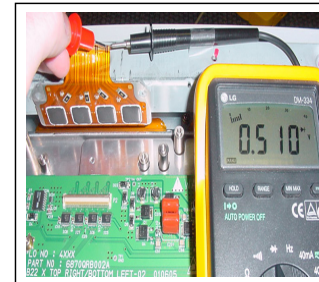
Shorted? Defective Panel



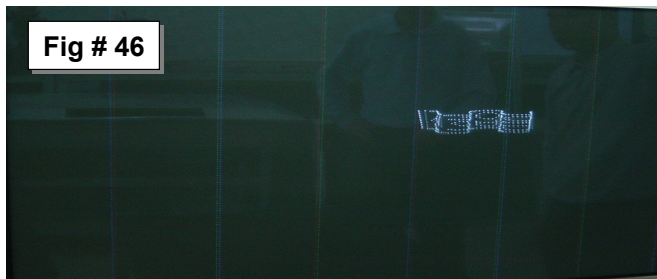
X-Board WF test point



X-Board Sustain WF



C.O.F IC test 4 Defective Panel



Display's waves – V.S.C Board defective

Check & Adjust: PFC / VS / VA voltages to panel specifications



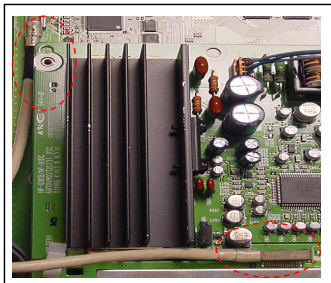
Check Connection VSC and Digital board



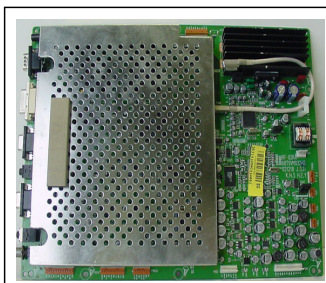
Okay? Replace VSC board



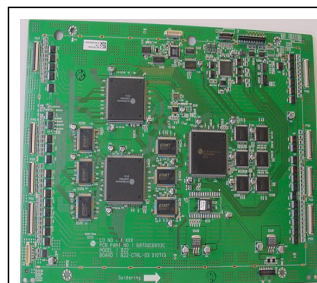
Not Resolved? Replace Digital board



VSC to Digital cable



VSC Board



Digital Control





Display's Vertical Bars – Defective Y-Sub-amp

Check & Adjust: PFC / VS / VA voltages to panel specifications



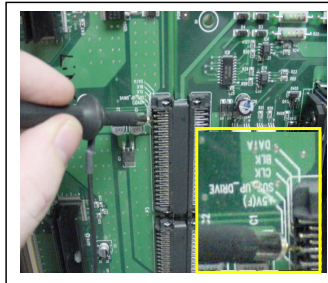
Check Y-Sustain Sub-amp wave form



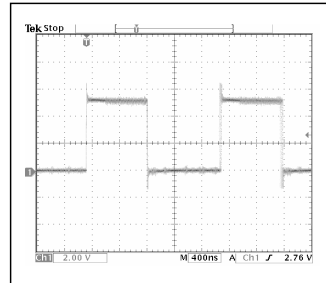
Okay? Replace Y-Sustain Amp



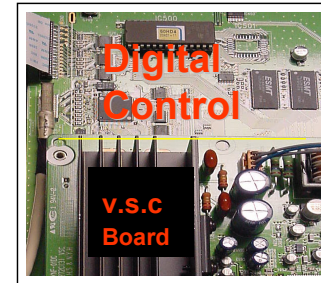
Not Resolved? Replace Digital Control board



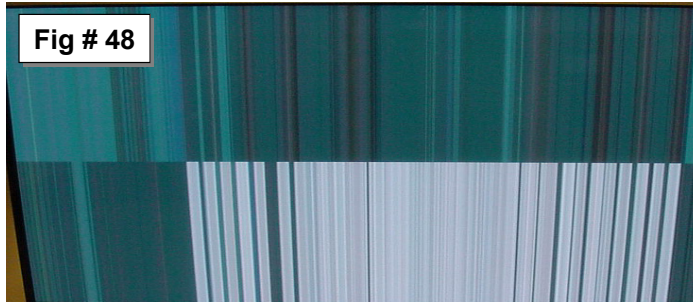
Y Sustain WF test point



Y Sustain WF



Digital Control board



Display's Vertical Bars – Defective Y-Sub-amp

Check & Adjust: PFC / VS / VA voltages to panel specifications



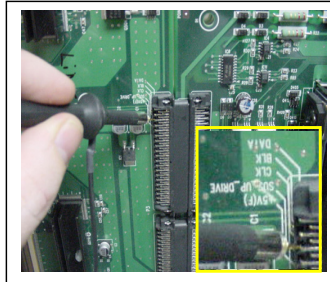
Check Y-Sustain Sub-amp wave form



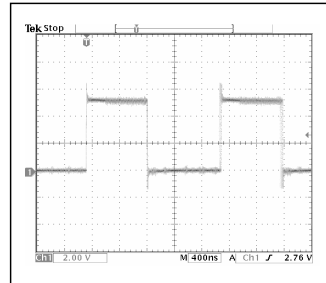
Okay? Replace Y-Sustain Amp



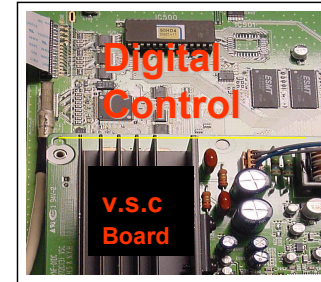
Not Resolved? Replace Digital Control board



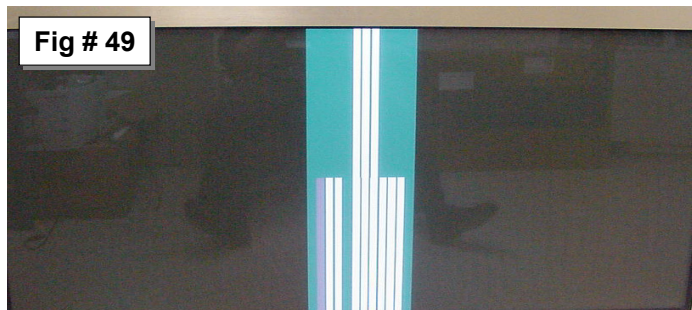
Y Sustain WF test point



Y Sustain WF



Digital Control board



Y-Driver - Top

Check & Adjust: PFC / VS / VA voltages to panel specifications



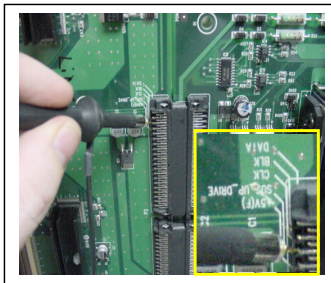
Check Y-Sustain Sub-amp wave form



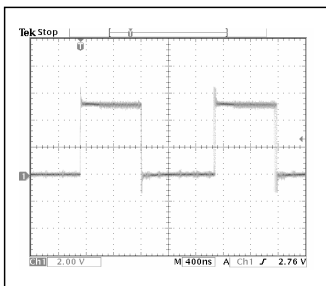
Okay? Replace Y-Sustain Amp



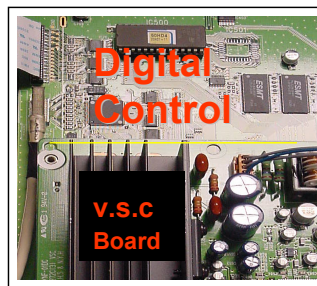
Not Resolved? Replace Digital Control board



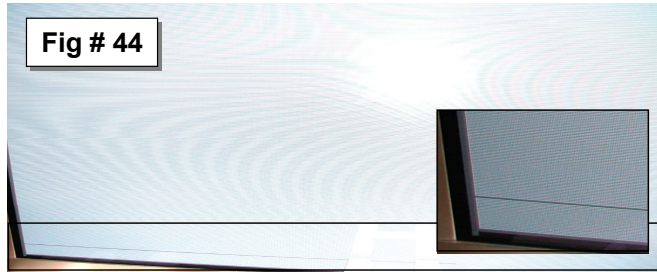
Y Sustain WF test point



Y Sustain WF



Digital Control board



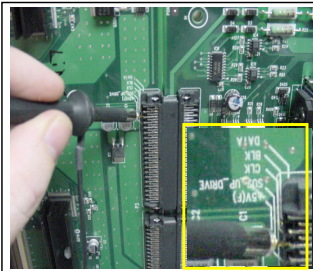
C.O.F IC – Ribbon shorted/ Part of Panel  
Defective Panel

Check & Adjust: PFC / VS / VA voltages to panel specifications

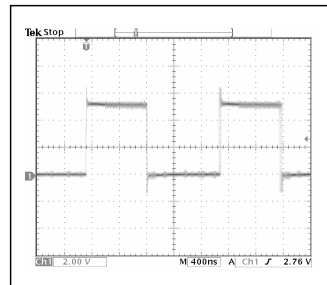
Check Y-Sustain Sub-amp wave form

Okay? Check for C.O.F IC Short

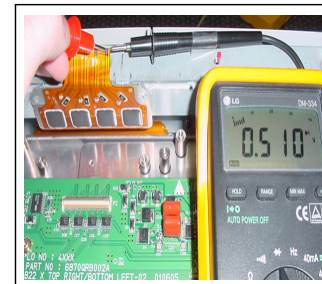
Shorted? Defective Panel



Y-Sustain Sub-amp test point



Y Sustain WF



C.O.F IC test 4 Defective Panel



VSC- Board

Check & Adjust: PFC / VS / VA voltages to panel specifications



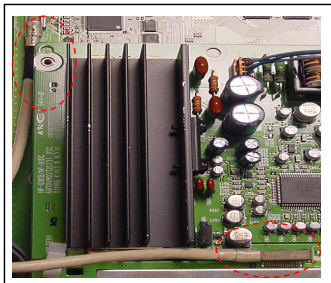
Check Connection VSC and Digital board



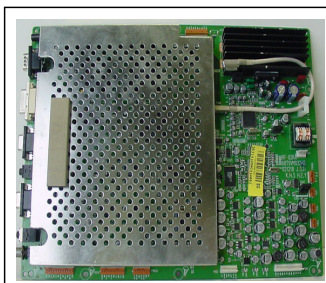
Okay? Replace VSC board



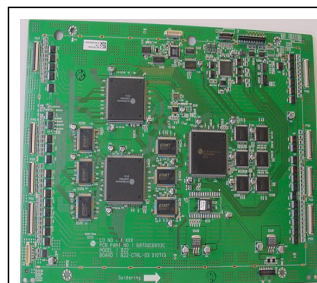
Not Resolved? Replace Digital board



VSC to Digital cable

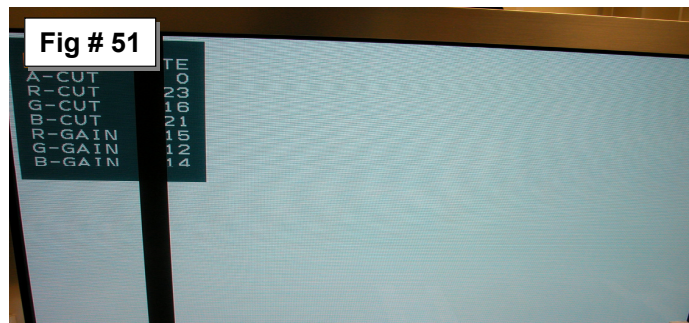


VSC Board



Digital Control





Y-Driver - Top

Check & Adjust: PFC / VS / VA voltages to panel specifications



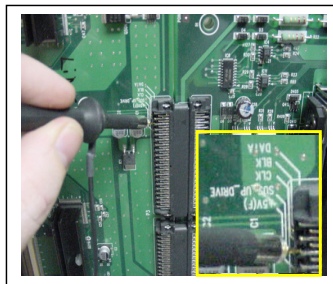
Check Y-Sustain Sub-amp wave form



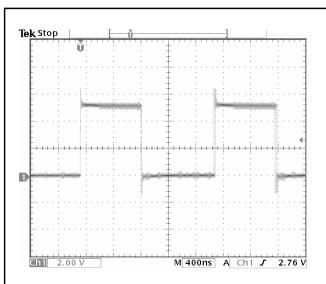
Okay? Replace Y-Sustain Amp



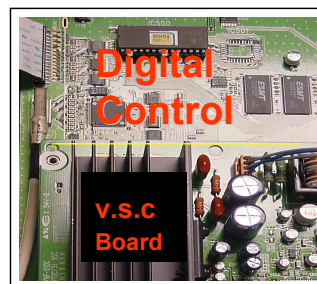
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board



Y-Driver Amp upper

Check & Adjust: PFC / VS / VA voltages to panel specifications



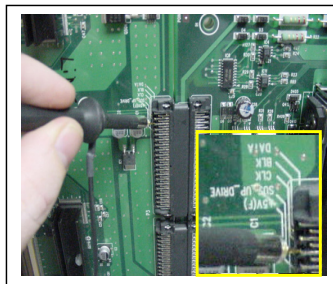
Check Y-Sustain Sub-amp wave form



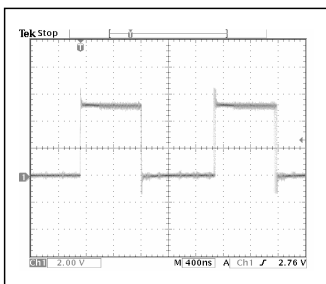
Okay? Replace Y-Sustain Amp



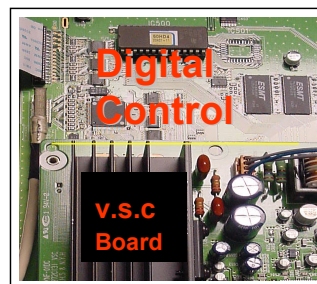
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board



Digital Control board

Check & Adjust: PFC / VS / VA voltages to panel specifications



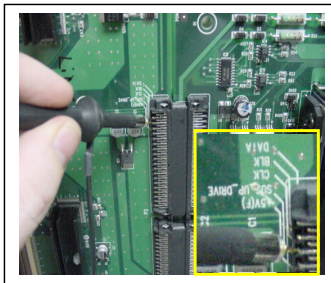
Check Y-Sustain Sub-amp wave form



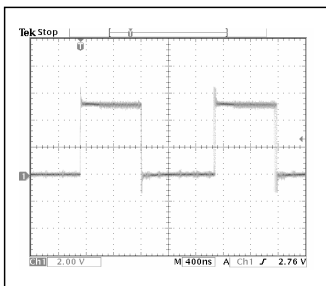
Okay? Replace Y-Sustain Amp



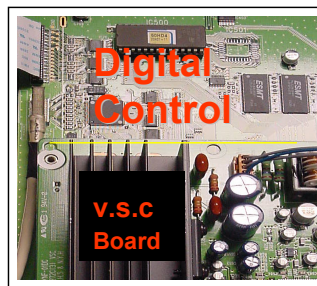
Not Resolved? Replace Digital Control board



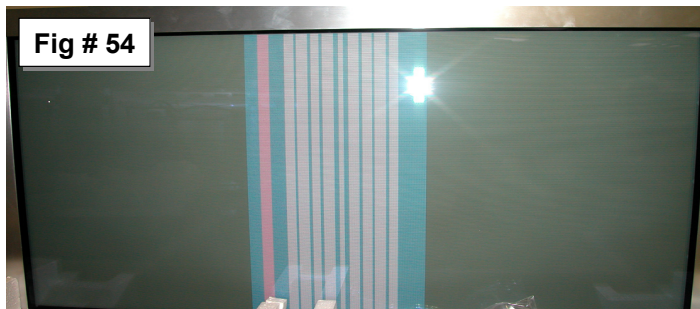
Y Sustain WF test point



Y Sustain WF



Digital Control board



Digital Control Board

Check & Adjust: PFC / VS / VA voltages to panel specifications



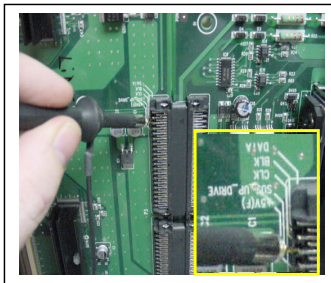
Check Y-Sustain Sub-amp wave form



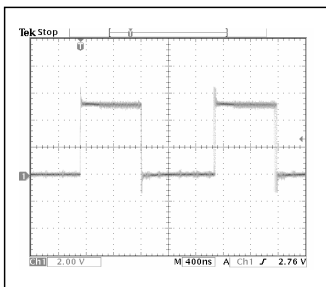
Okay? Replace Y-Sustain Amp



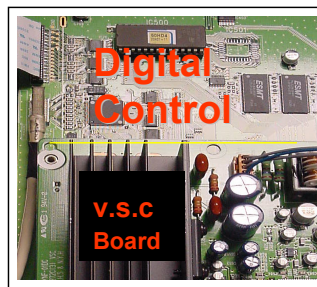
Not Resolved? Replace Digital Control board



Y Sustain WF test point



Y Sustain WF



Digital Control board

**Type of connector : D-Sub 9-pin male**

\* Use a null modem cable.

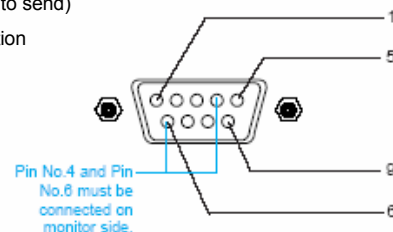
Wire the 7-Wire cable so that each pair of data lines cross between the two devices. These data line pairs are RXD (Receive data) and TXD (Transmit data), DTR (DTE side ready) and DSR (DCE side ready), and RTS (Ready to send) and CTS (Clear to send).

When using the 3-Wire cable connected to RXD, TXD and GND; Pin No. 4 (DTR) and Pin No. 6 (DSR) must be connected to the monitor. (The cable must be disconnected from the Monitor to be able to use the remote control and Monitor front panel controls.)

\* With the RS-232 input connected, the Monitor cannot be controlled by both an external control device and the remote control at the same time. The Monitor can only be controlled by either the remote control or the external control device.

**No. Pin Out/ key**

- 1 No connection
- 2 RXD (Receive data)
- 3 TXD (Transmit data)
- 4 DTR (DTE side ready)
- 5 GND
- 6 DSR (DCE side ready)
- 7 RTS (Ready to send)
- 8 CTS (Clear to send)
- 9 No Connection



# Hyper terminal



**7-Wire Cable Configuration**

- The Monitor is available to switch between external adjustment and remote control adjustment using a control line.

Note: If the control line is high, the monitor is controlled by the external control device. If the control line is low, the Monitor is controlled by the Monitor's remote control.

**3-Wire Cable Configuration**

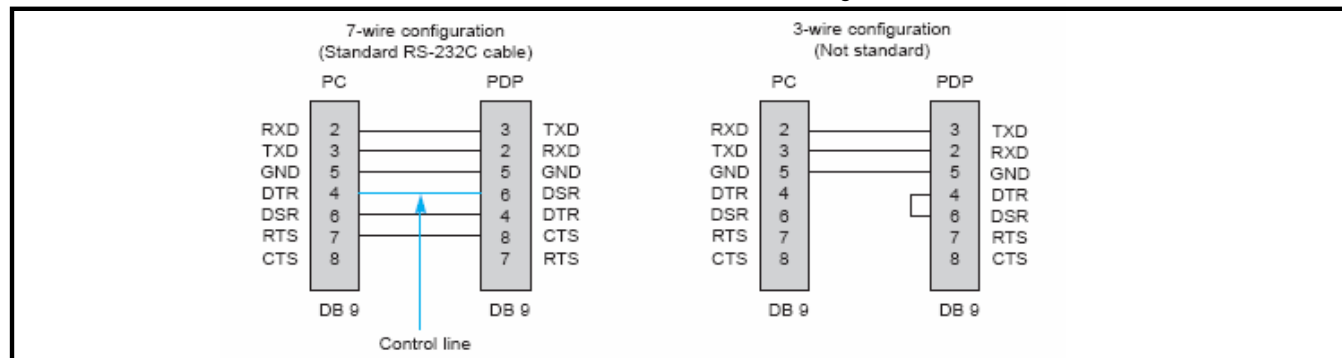
- When using a 3-Wire cable configuration, there is no control line. The external equipment can command the Monitor to "change into remote control adjustment mode". When using a 3-Wire cable configuration, there is no control line. The external control device must put the Monitor into the "change into remote control adjustment mode". The Monitor will then be able to be controlled by the remote control. If the Monitor is turned back on, it will revert back to external device control.

- The external control device must put the Monitor into the "change into remote control adjustment mode" function in 7-Wire Configuration.

**3-Wire Cable Configuration**

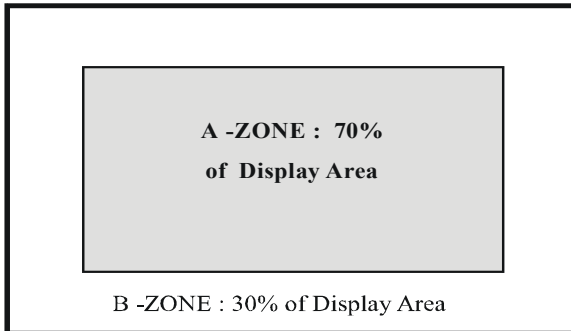
- When using a 3-Wire cable configuration, there is no control line. The external equipment can command the Monitor to "change into remote control adjustment mode". (When using a 3-Wire cable configuration there is no control line. The external control device must put the Monitor into the "change into remote control adjustment mode" & The Monitor will then be able to be controlled by the remote control). If the Monitor is turned back on, it will revert back to external device control.

- The external control device must put the Monitor into the "change into remote control adjustment mode" function in 7-Wire Configuration.



### 1) Cell defect definition

- Non-ignition dot (dark defect): In a ignited cell, the cell that an extinguished size is less than 50%. Cells which are not working.
- Non-extinguishing dot(brightness defect): In an extinguished cell, the cell that a ignited size is more than 50%. Cell which is always working "ON".
- Unstable Dot (Flickering): Cell which repeats on (brightness) and off (darkness).
- Uncontrollable Dot : Cell which is brighter or stays on longer than other cells around it because of unstable working condition.

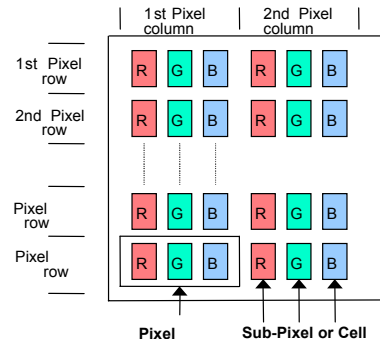


### 2) Test results are satisfied with each full red, green, blue, black and white test pattern.

- Specifically, The full white test pattern is used to decide the number of continuous cell defects, The full black test pattern is used to decide the number of Non-extinguishing cell defects.
- The decision distance is 2.2m (3H, 60") away from the panel, intensity of illumination is between 100 Lux and 200 Lux.

### 3) Cell defects do not increase or progress as time goes on.

## PDP CELL DISPLAY AND DEFECT ZONES Display Dot Diagram



FUNCTION	P 4 0 V 2 2	P 4 0 V 2 4	P 4 2 W 2 2 B / H	P 5 0 W 2 6 P 5 0 W 2 6 B	P 5 0 W 2 8 A	D P D P 6 0 W	P 6 0 W 2 6 A	P 6 0 W 2 6 P	TYPE	S T A R T	1D	2D	3D	4D	5D	6D	7D	ST A R T B I T	H E X C O D E	
FUNCTION																				
POWER ON	X	X				X			5-BIT, DOUBLE-START	D	0	1	1	1	0				D5	0E
SYSTEM OFF	X	X				X			5-BIT, DOUBLE-START	D	0	1	0	0	0				D5	08
POWER ON			X	X	X	X	X	X											04	C4
POWER OFF					X	X													04	C5
SYSTEM OFF			X	X			X	X											04	C5
RGB & POWER ON			X					X											04	98
RGB-1					X	X													04	98
RGB 2					X	X													04	C6
VIDEO & POWER ON			X					X											04	5A
VIDEO					X	X													04	5A
S-VIDEO & POWER ON			X					X											04	51
S-VIDEO					X	X														
COMPONENT & POWER ON			X					X											04	BF
COMPONENT					X	X														
COMPONENT 2									FUTURE										04	D4
16:9 (ASPECT RATIO)			X		X	X		X											04	77
4:3 (ASPECT RATIO)			X		X	X		X											04	76
ZOOM (ASPECT RATIO)			X		X	X		X											04	AF

# Plasma Cell Defect Form

# Visual Problems

	(01)	(02)	(03)	(04)	(05)	(06)
<b>A-Zone</b>	(16)	(A)	(B)	(C)	(D)	(07)
	(15)	(E)	(F)	(G)	(H)	(08)
<b>B-Zone</b>	(14)	(13)	(12)	(11)	(10)	(09)

## Fax to:

LG Tech Support  
 Fax #: 256.774.4051  
 Email: techsupport@lge.com

## Description:

### Non-Extinguishing Pixels

Pixel that remains on/ illuminating the Sub-pixel Red/ Blue/ Green.

### Non-Illuminating Pixels

Pixel that remains off/ not illuminating the Sub-pixel Red/ Blue/ Green.

Model Number : \_\_\_\_\_ Serial Number : \_\_\_\_\_ Servicer Acct : \_\_\_\_\_

Customer's Name : \_\_\_\_\_ Date of Purchase: \_\_\_\_\_ RA# : \_\_\_\_\_

<b>A-Zone (A -H) Cell Defects</b>	Location(s)	Quantity
<b>Non-Extinguishing Pixels</b>		
(Red)	_____	_____
(Blue)	_____	_____
(Green)	_____	_____
<b>Flickering Pixels or Non-Illuminating Pixels</b>		
(Red)	_____	_____
(Blue)	_____	_____
(Green)	_____	_____

<b>B-Zone (1 -16) Cell Defects</b>	Location(s)	Quantity
<b>Non-Extinguishing Pixels</b>		
(Red)	_____	_____
(Blue)	_____	_____
(Green)	_____	_____
<b>Flickering Pixels or Non-Illuminating Pixels</b>		
(Red)	_____	_____
(Blue)	_____	_____
(Green)	_____	_____

Div.	42"		50"		60"	
Zone	A - Zone	B - Zone	A - Zone	B - Zone	A - Zone	B - Zone
Non ignition Dot And Unstable Dot	<p>* N≤3 [Cells / RGB screen]  <b>Total N≤9</b> [Cell/ full screen]                      *2cell conjunction point:  <b>N≤0</b>                      *include Unstable dot:  <b>N ≤4</b></p>	<p>* N≤5 [Cells / RGB screen]  <b>Total N≤15</b> [Cell/ full screen]                      *2cell conjunction point:  <b>N≤2*3cell</b>                      conjunction point:  <b>N =0</b>                      *Unstable dot:  <b>N≤7</b></p>	<p>*N≤ [Cells / RGB screen]  <b>Total N≤4</b> [Cell/full screen]                      *2cell conjunction point:  <b>N&lt;*3cell</b>                      conjunction point:  <b>N = 0</b>                      Unstable dot:  <b>N ≤</b></p>	<p>* N≤ [Cells / RGB screen]  <b>Total N≤11</b> [Cell/ full screen]                      *1cell conjunction point:  <b>N&lt;*3cell</b>                      conjunction point:  <b>N = 0</b>                      *Unstable dot:  <b>N≤</b></p>	<p>* N≤11 [Cells / RGB screen]  <b>Total N≤33</b> [Cell/ full screen]                      *2cell conjunction point:  <b>N≤2*3cell</b>                      conjunction point:  <b>N =0</b>                      *Unstable dot:  <b>N≤11</b></p>	<p>* N≤12 [Cells / RGB screen]  <b>Total N≤36</b> [Cell/ full screen]                      *2cell conjunction point:  <b>N≤2*3cell</b>                      conjunction point:  <b>N =0</b>                      *Unstable dot:  <b>N ≤12</b></p>
Uncontrollable Dot	<b>N=0</b>	<p>N≤2 [Cells/ RGB screen]  <b>Total N≤6</b> [Cells / full screen]</p>	<b>N=2</b>	<p>N≤3 [Cells / RGB screen]  <b>Total N≤</b> [Cells / full screen]</p>	<p>N 2 [Cells / RGB screen]  <b>Total N6</b> [Cells / full screen]</p>	<p>N 3 [Cells / RGB screen]  <b>Total N9</b> [Cells / full screen]</p>
Non extinguishing Dot	N=0	N=0	N=0	N=0	N = 0	N = 0
Defect distance	50mm ≤		50mm ≤		D ≥5cm, N 1 (D: Centimeter) ; however, including conjunction cell, N = 0	
Total Defect	<b>N ≤ 25</b> [Cell/ full screen]		<b>N ≤ 25</b> [Cell/ full screen]		<b>N ≤ 35</b> [Cell/ full screen]	
Stain	<p>*1≤D≤5, N≤3                      *D&gt;5, N=0</p>		<p>* 1≤D≤5, N≤3                      * D&gt;5, N=0</p>		<p>* 1≤D≤5, N ≤ 3 (Stain Distance:≥50 mm)                      * D&gt;5, N = 0 (Stain Distance:≥50mm)</p>	



